



United States Environmental Protection Agency  
Washington, DC 20460

## Work Assignment

Work Assignment Number

2-1

☒ Original ☐ Amendment Number:

Contract Number  
EP-W-08-018

Contract Period  
Base Option Period Number: 11

Title of Work Assignment  
IPM Architecture Maintenance and Enhancement

Contractor  
ICF SERVICES COMPANY, L.L.C.

Specify Section and Paragraph of Contract SOW

Purpose: ☒ Work Assignment Initiation ☐ Work Assignment Close-Out  
☐ Work Assignment Amendment ☐ Incremental Funding  
☐ Work Plan Approval

Periods of Performance

From: 03/11/10

To: 03/10/11

Comments:

The contractor shall prepare a work plan and cost estimate in accordance with the attached Statement of Work. However, the Government intends to incrementally fund the work assignment and to authorize lower Cost/Fee and LOE hour ceilings, including an initial 3100 LOE hours.

☐ Superfund

### Accounting and Appropriations Data

☒ Non-Superfund

	DC (Max 6)	Budget/FYs (Max 4)	Appropriation Code (Max 6)	Budget Org/Code (Max 7)	Program Element (Max 9)	Object Class	Amount	(Dollars)	(Cents)	Site/Project (Max 8)	Cost Org/Code (Max 7)
1											
2											
3											
4											
5											

### Authorized Work Assignment Ceiling

Contract Period: Cost/Fee LOE  
Previously Approved

This Action

Total \$0.00 13,400

### Work Plan / Cost Estimate Approvals

Contractor WP Dated: Cost/Fee: LOE:  
Cumulative Approved: 03/08/10 Cost/Fee: \$0.00 LOE: 13,400

Work Assignment Manager Name

ELLIOT R. LIEBERMAN

(Signature)

(Date)

Branch/Mail Code

Phone Number

Fax Number

Project Officer Name

RYAN T. DANIELS

(Signature)

(Date)

Branch/Mail Code

Phone Number

Fax Number

Other Agency Official Name

DEBRA A. MILLER

(Signature)

(Date)

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Contracting Official Name

DEBRA A. MILLER

(Signature)

(Date)

Branch/Mail Code 3803R

Phone Number 202-564-1041

Fax Number

Contractor Acknowledgement of Receipt and Approval of Workplan (Signature and Title)

Date

# IPM Architecture Maintenance and Enhancement

Contract: EP-W-08-018, Work Assignment: 2-1

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## Summary Information

Title: IPM Architecture Maintenance and Enhancement  
Period of Performance: From: 03/11/10  
To: 03/10/11  
Award Date:  
Total Funding:

## Procurement Management Roles

### WORK ASSIGNMENT MANAGER:

U.S. E.P.A.  
Attn: ELLIOT R. LIEBERMAN  
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## Attachments

Attachment Name

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IPM Architecture Maintenance and Enhancement SOW

# **IPM Architecture Maintenance and Enhancement SO**

Contract: EP-W-08-018, Work Assignment: 2-1

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## **WORK ASSIGNMENT STATEMENT OF WORK**

**Title** IPM Architecture Maintenance and Enhancement

**Contractor and Contract #:** EP-W-08-018 (ICF)

**Work Assignment #:** WA 2-1

**Estimated Level of Effort:** 13,400 LOE hours

The contractor will prepare a work plan at the full estimated 13,400 LOE hours. However, the Government intends to fund and authorize lower Cost/Fee and LOE hours ceilings upon approval of the Contractor's submitted full work plan and cost estimate. The initial LOE hours is expected to be 3100 hours.

### **EPA Key Personnel:**

#### **Work Assignment Contracting Officer's Representative (COR):**

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#### **Contracting Officer (CO):**

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Contract Specialist  
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## **I. BACKGROUND AND PURPOSE**

Electric power plants are a significant source of sulfur dioxide (SO<sub>2</sub>), nitrogen oxides (NO<sub>x</sub>), mercury (Hg), and carbon dioxide (CO<sub>2</sub>) emissions and thus affect a number of air pollution issues.

To evaluate alternative strategies for reducing air emissions from electric power plants, EPA uses the Integrated Planning Model (IPM), a model of the U.S. electric power sector developed and maintained by ICF Consulting, Inc.. To keep its IPM based projections current, EPA must continually update assumptions that drive this model and expand the model's analytical capabilities. The EPA Base Case assumptions were developed under Work Assignments 02AA 13, 03AA 13, 04AA 28, and 05AA 28 (contract 68 W6 0049) and updated and enhanced under Task Orders 10, 15, and 31, (contracts 68 D7 0081), Work Assignments 1-3, 2-3, 3-3, and 4-3 (contract 68-W-03-028), and Work Assignment 0-1 and 1-1 (contract EP-W-08-018).

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# **IPM Architecture Maintenance and Enhancement SO**

Contract: EP-W-08-018, Work Assignment: 2-1

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Among the primary purposes of this Work Assignment will be to complete Spring 2010 and July 2010 IPM Base Cases (designated v.4.0 and v.4.10 respectively), support the documentation and peer review of these base cases, and begin work on a July 2011 IPM Base Case (designated as v.4.11). Under this Work Assignment the Contractor shall update selected parameters, enhance capabilities to analyze policy scenarios scheduled for consideration over the next 12 to 18 months, improve reporting capabilities, support peer review of these updates and enhancements, improve model run time, and perform further IPM diagnostic runs. This work assignment will also include continuing technical support activities for coordinated modeling using IPM and EIA's NEMS (National Energy Modeling System) model and performing model runs and follow-up analysis for comparative modeling exercises, e.g., those sponsored by Stanford University's Energy Modeling Forum. It may also include model development activities for non-U.S. modules, e.g., an IPM Mexico and/or IPM China module.

Beyond routine updates required to keep underlying assumptions technically sound, key areas of focus in this option period will be on incorporating energy efficiency into CO<sub>2</sub> modeling, providing the capability of modeling hazardous air pollutants (HAPs), making use of available data from EPA's 2009-2010 Information Collection Request (ICR), enhancing modeling capabilities (e.g., in the representation of transmission and "smart grid") and performing validation exercises in response to peer review comments obtained in previous option periods, providing the capabilities needed to assess the impact of Climate Change on the U.S. power sector, revising the methodology and assumptions used in the cost and performance assumptions for SO<sub>2</sub>, NO<sub>x</sub>, and mercury emission controls, supporting the next round of peer review of selected changes made to the EPA base case in the previous option period (e.g., coal supply and transportation assumptions), making fully operational the previously prototyped iterative data exchange with the National Energy Modeling System (NEMS) for use in energy-sector-wide analysis, improving the data exchange with the Applied Dynamic Analysis of the Global Economy (ADAGE) computable general equilibrium (CGE) model for economy-wide analysis, and building a routine capability into the EPA base case to capture power sector impacts on other environmental media besides air, e.g., cooling water temperature discharges and coal ash containment and disposal.

None of the work performed under this work assignment will duplicate work performed under previous work assignments or task orders.

## **II. CONTRACT LEVEL STATEMENT OF WORK REFERENCE**

The tasks to be performed under this work assignment are consistent with the provisions of Attachment 1 (Statement of Work) for Contract EP-W-08-018.

## **III. STATEMENT OF WORK TASKS**

### **Task 1- Prepare Work Plan:**

In accordance with the terms and conditions of contract clause B.2 entitled "Work Assignments" and the section of contract Attachment 1 entitled "Preparation and Submission of Work Plans," the Contractor shall prepare a Work Plan for 13,400 hours with the understanding that the Government may set lower authorized Cost/Fee and LOE hour ceilings to start the work assignment. The government expects the initial LOE hour ceiling to be 3100 hours. The contractor may use the results obtained from, but not duplicate services provided under Work Assignment 1-1 and related work assignments under previous contracts.

Note: If development work on non-U.S. IPM modules are performed under the tasks below, the contractor upon request from EPA shall report total monthly and cumulative hours separately for IPM U.S. and the non-U.S. in

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the contractor's standard monthly "Financial Detail Task Order Report."

## **Task 2 - Design, Programming, Testing, and Implementation of Selected Updates and Enhancements of IPM**

The Contractor shall update selected internal parameters and capabilities of the Integrated Planning Model and EPA Base Case assumptions to ensure that model results are based on the most recent input data. The COR will specify in technical direction (TD) the particular functional areas to be updated. These functional areas include updating the NEEDS (National Electric Energy Data System) database of existing and planned electric generating units, updating the cost and performance assumptions of new electric generating, and emission control technologies, fuel cost and supply assumptions, emission and heat rate assumptions, power system operation assumptions, Federal and state environmental and renewable energy regulations, financial assumptions, and run year assumptions.

For selected functional areas and at the direction of the COR, the Contractor shall prepare a typed 5-15 page issue paper that will include the description of the parameters and capabilities to be updated, the policy and technical issues to be resolved, and the sources of data for the update.

Based on the COR's review, feedback and TD authorizing the implementation of the update, the Contractor shall design and implement the update. The Contractor shall provide the COR with interim deliverables adequate to monitor the progress of these activities. At the time of initial testing and immediately before deployment of the functional improvements, the Contractor shall provide the COR with input (e.g., DAT and EMS files) and output report files (e.g., RPT and RPE files) demonstrating the capabilities of the improvements.

For the purposes of budgeting, the Contractor shall assume that the COR will request 6-8 issue papers on functional areas identified by the COR. The COR will review the issue papers, provide feedback and issue technical direction authorizing implementation. The Contractor shall design and implement the approved changes and test them. Once debugging is completed, the Contractor shall provide the COR with interim deliverables to monitor progress of activities, including suitable IPM input and output files.

Under this task, the Contractor shall also revise and enhance the NEEDS Comment Input Tracking Tool previously developed and enhanced under Work Assignments 3-3 and 4-3 (Contract 68-W-03-028) and Work Assignments 0-1 and 1-1 (Contract EP-W-08-018). The purpose of the tool is to enable the Contractor, EPA, and others to update the NEEDS database on an ongoing basis, track and screen proposed updates, and generate interim versions of the database between releases of EPA base cases. The Contractor shall propose revisions for EPA review and shall implement revisions selected by EPA. For purposes of budgeting the Contractor shall assume that two rounds of such revisions will be required.

## **Task 3 - Model Enhancements to Support Analysis of New Environmental Initiatives:**

The Contractor shall prepare three 10-20 page technical memoranda for 3-5 model enhancements identified by the COR. These memorandum shall cover one or more of the following areas as identified by the COR: model enhancement option assessments and recommendations, technical specification development, implementation proposals, and areas affecting model realization. Topics will be defined in Technical Direction issued by the COR. Possible topics include defining the technical requirements for modeling climate change impacts on the power sector, modeling hazardous air pollutants (HAPS) in IPM, and coordinated accounting of water and waste disposal impacts of electric power generation. The COR will review the technical memoranda prepared by the Contractor, provide feedback to resolve technical and policy issues, and issue TD authorizing programming to

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implement selected enhancements. The Contractor shall implement the selected enhancements and provide the COR with interim deliverables (i.e., diagnostic runs), which will be used to monitor progress and obtain feedback from the COR on further alterations that are necessary before the improvements are fully deployed.

Following up on activities initiated under Work Assignments 0-1 and 1-1 (Contract EP-W-08-018), the Contractor shall continue to provide technical support for information exchanges with the National Renewable Energy Laboratory (NREL) aimed at developing possible improvements for modeling renewables in IPM, including possible improvements to input data files. For purposes of budgeting the Contractor shall plan to participate in 6 one-hour telephone meetings and 2 two-hour onsite meetings at EPA's offices in Washington, D.C.

## **Task 4 - Reporting Improvements**

The Contractor shall work with the COR and EPA analysts on an ongoing basis to identify, develop, and implement new reporting improvements. The Contractor shall obtain feedback on the shortcomings in the current IPM reports and develop prototypes to remedy the shortcomings and provide additional capabilities. For purposes of budgeting, the Contractor shall assume that three prototypes will be required. Each prototype will contain output data from a real IPM run to be selected by the COR and will represent a complete illustration of the improved reporting capability. The Contractor shall consult with the COR about the format of the prototype, which could possibly include a report, data files, software application, or a combination these formats.

Based on comments from EPA staff, the Contractor shall prepare final operational versions of the new reporting prototypes and incorporate them into the standard outputs provided to EPA on all subsequent model runs. Before delivery to EPA the prototypes will be fully tested, debugged, and quality assured to eliminate errors and ensure operability.

Following up on work initiated under Work Assignments 0-1 and 1-1 under this contract, the Contractor shall provide technical support for research that EPA is conducting on advanced decision making tools that can be applied to IPM model run inputs and outputs. The Contractor shall also continue to provide technical support for EPA's effort to pass IPM outputs to and receive inputs from economy-wide and energy-sector-wide models (like the Energy Information Administration's National Energy Modeling System (NEMS) model) and the Applied Dynamic Analysis of the Global Economy (ADAGE) computable general equilibrium (CGE) model. These technical support activities shall include providing input and output files from previously performed model runs and participation in 10 one-hour telephone meetings on topics related to this project.

## **Task 5 - Parsing and Post-Processing Tool Improvement**

The Contractor shall update and make further improvements to the tool used to parse the aggregated model results at the model plant level to the individual generating unit level, with the goal of improving the clarity, consistency, and usability of the resulting output files.

The Contractor shall also engage in further enhancements to the post-processing software which generates parameter values required for air quality modeling. Enhancements will involve incorporating into the post-processing tool additional improved procedures developed by EPA for calculating emissions not directly represented in the IPM. The Contractor shall prepare a 5- 10 page memorandum describing options and a proposed approach. The COR will provide technical direction on the approach that will be implemented. The Contractor shall initiate the update and provide the COR with interim deliverables sufficient to monitor progress.

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The Contractor shall provide technical support to address parsing and post-processing issues that were not resolved under previous Work Assignments.

## **Task 6 - Validation Evaluations**

Under this task, the Contractor shall perform validation exercises that follow up on comments obtained in the peer review performed under Work Assignments 0-1 and 1-1. The Contractor shall identify the issues to be addressed in the validation exercise and propose approaches to be used in performing the validation. After review, revision, and authorization to proceed by the COR, the Contractor shall carry out the validation activities. The Contractor shall provide the COR with interim deliverables adequate to monitor the progress of these activities, including input (e.g., DAT and EMS files) and output report files (e.g., RPT and RPE files) from the IPM validation runs. On completion of this validation exercise, the Contractor shall deliver a 5-15 page technical memorandum containing a detailed description of the data that was used, the procedures that were performed, and the results that were obtained. The contractor shall also deliver data files and model input and output files from the IPM runs that were used in the validation.

## **Task 7 - Documentation**

The Contractor shall provide tables, figures, and limited text needed to enable EPA to prepare documentation reports for base cases prepared under this Statement of Work.

This will involve preparing an outline for the full report and identifying the tables, figures, text, and other items to be developed by the Contractor. Besides providing comprehensive documentation for the types of assumptions covered under previous base cases, the Contractor shall give particular attention to documenting assumptions that were not included in documentation for previous base cases and to correcting assumptions that were inadequately or wrongly documented in these previous base cases. In this regard, the contractor shall prepare a 5-15 page technical memorandum listing new assumptions that need to be documented and previous assumptions that need to be revised, enhanced or corrected. For each new and revised assumption the technical memorandum shall specify the form that the documentation will assume (i.e., tables, figures, maps, text, etc.).

Using the materials provided by the Contractor, EPA will draft the report. The Contractor shall review and provide comments (using redline and strikeout in an electronic version of the draft report) for two revisions of the initial draft report. For purposes of budgeting, the Contractor shall assume that documentation reports prepared under this Statement of Work will be comparable in length and content to "Standalone Documentation for EPA Base Case 2004 (V.2.1.9) Using the Integrated Planning Model" (September 2005) and "Documentation for EPA Base Case 2006 (v.3.0) using the Integrated Planning Model" (November 2005), which were prepared by EPA and the Contractor following a similar procedure.

The Contractor shall provide complete set of documentation items (i.e., tables, figures, and limited text) for the July 2010 Base Case (designated v.4.10) and assume that the required number of tables, figures, and text will be no more than 20% greater than those prepared for the v.3.0 documentation report. In addition, the contractor shall bring to completion documentation begun in the previous option period on the Spring 2010 IPM Base Case (designated v.4.0). For purposes of budgeting the Contractor shall assume that the v.4.0 documentation materials required under this Work Assignment shall include a limited number of additional items (i.e., no more than 30) beyond those previously specified in Work Assignment 1-1.

## **Task 8 - Model Size and Speed Assessment and Upgrade**

The Contractor shall conduct ongoing assessments of available hardware and software upgrades required to keep model run time under 8 hours for all variants of IPM developed under this Work Assignment including an IPM variant that includes more than 6 model run years; a single pass capability to represent demand response; a full array of generating technologies; emission control retrofits for SO<sub>2</sub>, NO<sub>x</sub>, CO<sub>2</sub>, Hg and HAPs; national, multi-national, regional, and state emissions regulations; trading, banking, and bonus allowance capabilities; and coverage of the entire North American power market (U.S., Canada, and Mexico).

Every three months or as requested by the COR, the Contractor shall identify various hardware and software options that could help meet EPA's proposed run specifications. The Contractor shall also assess each of the identified options with respect to estimated run time provided by the option, time required to implement, start up and ongoing cost to deploy, and pros and cons of the alternative. Based on the COR's direction, the Contractor shall select an option(s) that could bring run time within the 8 hour limit. The Contractor shall implement and deploy the chosen option with a view to make it operational within 3 months of the choice of the option.

The Contractor shall also continue to provide technical support in the periodic effort to perform IPM runs on supercomputers at EPA's National Environmental Supercomputer Center or other computing facilities. The effort would involve the Contractor using IPM to generate standard MPS (Mathematical Programming Software) files that can be run on the designated supercomputer. The Contractor shall participate in periodic teleconferences (not to exceed one two hour teleconference per month) to evaluate supercomputer performance and address problems that may arise. (Note: Performance of this activity is contingent on EPA's establishing the appropriate license agreements with the Supercomputer Center or other facilities.)

## **Task 9 - Performing Model Runs**

The contractor shall perform 40 diagnostic IPM runs in the course of preparing the base cases through the activities described above in Tasks 2-4. For each model run, the Contractor shall provide the COR with run specifications, input (e.g., DAT and EMS files) and output report files (e.g., System Summary Reports, RPT and RPE files)

## **Task 10 - Parsing and Post-Processing Results from Model Runs**

For diagnostic purposes, the Contractor shall perform six (6) parsings and post-processings of IPM run outputs produced under Task 9. The COR will identify the runs and run years to be used. The Contractor shall deliver the parsed and ORL (one record line) files within three (3) working days after a request to proceed.

## **Task 11 - Expert Panels, Work Groups, and Special Studies**

The Contractor shall propose nationally and internationally recognized experts beyond the contractor's immediate staff, to develop assumptions for incorporation in future EPA base cases on up to five (5) topic areas to be identified by the COR. Possible topic areas include, but are not limited to the following:

- (a) Developing cost and performance specifications for HAP emission controls.
  - (b) Developing nuclear fuel supply curves needed for modeling out to 2070
  - (c) Developing smart grid scenarios and procedures for their inclusion in IPM runs.
  - (d) Identifying power sector impacts on environmental media besides air and procedures for their representation in IPM.
  - (e) Providing data to improve the representation of existing and planned/committed generating units in Alaska, Hawaii, Virgin Islands and Puerto Rico.
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(f) Using rigorous world macro economic, econometric, or other substantiated methods to derive short-term (5-10 year) and long-term (out to 2070) cost escalation factors for inputs used in EPA Base Case, v.5.0 .

The proposed experts shall have

- o demonstrated expertise, 10+ years of professional experience, and recognized standing in the respective topic areas,
- o access to data and other information necessary to prepare the inputs required for IPM,
- o clearance to publicly release all data and other assumptions used in a future EPA base case and to prepare documentation fully describing data sources and the basis for the assumptions used in that base case,
- o availability to prepare materials and make presentations at expert peer review sessions on assumptions incorporated in the base case.

For each topic area the contractor shall

- o Draft technical specifications describing the issues and questions to be addressed by the experts,
- o Identify candidates with the requisite expertise.
- o Provide the COR with estimates of the cost, level of effort, and delivery schedules for the activities to be performed by outside experts.

EPA will review and determine whether to proceed with the Contractor's proposal. If the decision is to proceed, the Contractor shall put in place the procedures necessary to secure the identified experts and perform the work. In addition, the Contractor shall

- o provide technical support to enable EPA to review and provide feedback as the input assumptions are developed
- o ensure that all the inputs necessary for IPM are obtained
- o obtain data and documentation required for public release and peer review.

## **Task 12 - Technical Support for Peer Review of IPM**

The Contractor shall provide technical support for independent expert review of IPM assumptions, methodology and outputs. Under this work assignment, the Contractor shall complete the response document for the model formulation peer review that was conducted under Work Assignments 0-1 and 1-1 (Contract EP-W-08-018) and prepare and participate in up to two peer reviews of key assumptions in the Spring 2010 (designated v.4.0) and July 2010 (designated v.4.10) base cases. The specific topics of these peer review will be identified by the COR.

For each peer review, the Contractor shall prepare and disseminate documents for review, make presentations (approximately 40 slides or overheads each) at one 4 6 hour peer review meeting in Washington, DC or two 2-hour sessions by phone and/or the internet, participate in two 1-2 hour preparatory telephone meetings and two 1-2 hour post peer review telephone meetings, collect and summarize comments, and draft a 20-30 page response document. The EPA publication "Peer Review Handbook, 3rd Edition," EPA/100/B 06/002, January 31, 2006

([www.epa.gov/peerreview/pdfs/peer\\_review\\_policy\\_and\\_memo.pdf](http://www.epa.gov/peerreview/pdfs/peer_review_policy_and_memo.pdf)) and associated guidance documents shall be used as guidance for this task.

## **Task 13 - Quality Assurance and Quality Control Activities**

Under this task, the Contractor shall report at regular intervals (no less frequently than month) on activities

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Contract: EP-W-08-018, Work Assignment: 2-1

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being undertaken to demonstrate adherence to the Quality Assurance Project Plan for EPA Applications of IPM (the "QAPP"). Ten months after the start of this Work Assignment, the Contractor shall provide a 5-10 page technical memorandum documenting all the activities performed during the current work assignment to demonstrate that the procedures and criteria contained in the QAPP are being followed, including quality control procedures for data gathering and analysis and evaluation criteria for data sources and estimation methodologies. QC procedures may include file documentation and data checks, and forms to ensure that appropriate methodologies and assumptions are used.

## Task 14 - Conferences and Comparative Modeling Workshops

The Contractor shall provide one staff member to participate in one conference and in one comparative modeling workshop chosen by the COR. This activity has a twofold purpose: (a) to make presentations on IPM, its inputs, and/or related models (e.g., the modeling of HAPs) and (b) to obtain information relevant to updating and improving IPM and related models. The Contractor shall develop one presentation (consisting of approximately 40 slides) for delivery at the conference and another for presentation at the comparative modeling workshop. For purposes of budgeting, the Contractor shall assume that the conference and workshop are each three days in duration and in a location on the U.S. West coast.

## IV. DELIVERABLES

During the course of this work assignment the contractor shall participate by phone in weekly Architecture Status Meetings, one to two (1-2) hours in length.

Note: All electronic deliverables required under this work assignment shall be emailed to the COR and/or posted on the contractor's FTP site for downloading. The contractor shall also provide electronic versions of all deliverables on CD-ROM disks at the conclusion of the work assignment. The disk(s) will be accompanied by a hardcopy index of all items contained on the disk(s).

**Task 1:** Work Plan - in accordance with clauses B.2 and Attachment 1 of the contract

**Task 2:** Design, programming, testing and implementation of selected updates and enhancements of IPM

Six to eight 5-15 page issue papers	3 weeks from request to proceed
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Input and output files from six to eight (6-8) diagnostic runs	4 weeks from request to proceed
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NEEDS Comment Tracking Tool - Round 1 Revision	4 weeks from request to proceed
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NEEDS Comment Tracking Tool - Round 2 Revision	4 weeks from request to proceed
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**Task 3:** Model Enhancements to Support Analysis of New Environmental Initiatives

Three to five 10-20 page technical memorandum	3 weeks from request to proceed
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Input and output files from 3-5 diagnostic runs 4 weeks from request to proceed

Specifications and sample data files 2 weeks from request to proceed  
for information exchange with NREL

## **Task 4: Reporting Improvements**

3 draft reporting improvement prototypes 5 weeks from request to proceed

3 operational reporting improvement prototypes 8 weeks after obtaining feedback  
on draft prototypes

Input and output files from 1 week from request to proceed  
previously performed IPM runs (to be used in  
EPA's research on advanced decision making  
tools).

5-10 model runs and accompanying data files 1 week from request to proceed  
for testing data exchange and coordinated for each trial run  
modeling with IPM and NEMS

## **Task 5: Parsing and Post-Processing Tool Improvements**

Two (2) 5-10 page technical memoranda. 4 weeks from request to proceed  
(One covering improvements to the parsing  
procedure; the other covering enhancements to  
the post-processing procedure.)

Parsed output files from two (2) diagnostic runs 4 weeks from request to proceed

Two (2) draft and one (1) final one record 6, 8, and 10 weeks from request  
line (ORL) post-processing output files to proceed respectively

## **Task 6: Validation and Uncertainty Evaluations**

Input and output files from 4 weeks from EPA approval of  
validation runs validation proposal

One (1) technical memorandum (5-15 pages) 3 weeks from completion  
summarizing results of validation of validation runs

## **Task 7: Documentation**

(Note: The following four activities will be performed in their entirety for one full documentation report required under this work assignment. In addition, selective activities will be performed as required to bring to completion documentation begun in the previous option period for the base case scheduled to be released in Spring 2010.)

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Draft outline of report and appendices	2 weeks from request to proceed
Final outline of report and appendices on draft outline	2 weeks after receiving feedback
5-15 page technical memorandum on new and revised assumptions and how they will be documented	2 weeks from request to proceed
Tables, figures and limited text for documentation report	Ongoing for 6-12 weeks after finalizing outline
First and second mark-ups of draft documentation report	2 weeks from receipt of each draft report

## **Task 8: Model Size and Speed Assessment and Upgrade**

Telephone briefings on available options	Every 3 months by phone as part of Architecture Status meetings
Implementation of size and speed improvements.	Every six (6) months

## **Task 9: Performing Model Runs**

Specification for each of thirty (40) runs	1 day from request to proceed
Input and output files and updated run log for each of thirty (40) model runs	3 days from request to proceed

## **Task 10: Parsing results from model runs**

Spreadsheet files containing fully quality assured, parsed results for 6 parsings of IPM output files	3 days after request to proceed
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## **Task 11: Expert Panels, Work Groups, and Special Studies**

The following shall be prepared for up to 5 technical topic areas;

Draft and final technical specifications on issues and questions to be addressed by experts	3 weeks from request to proceed
List of candidates with required expertise	3 weeks from request to proceed
Estimate of cost, level of effort, and delivery schedule	3 weeks from request to proceed
Data and other information required	4 weeks from request to proceed

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for incorporation in IPM

Data and documentation required for public release and peer review 6 weeks from request to proceed

## **Task 12: Technical Support for Peer Review of IPM**

Three (3) presentations (approximately 40 slides or overheads each) 3 weeks from request to proceed

Three (3) summaries of comments (10-20 page each) 1 week after each peer review meeting

Three (3) response documents (20-30 page each) 2 weeks after each peer review meeting

## **Task 13: Quality Assurance and Control Activities**

Summary of QA/QC activities performed Monthly by phone as part of Architecture Status meetings

5-15 page technical memorandum 10 months from inception of this Work Assignment

## **Task 14: Conferences and Comparative Modeling Workshops**

Two (2) presentations (each consisting of approximately 40 slides) 3 weeks after request to proceed

Three (3) 1-2 page response to questions on previously performed model runs 3 days from request to proceed

1-2 addition model runs 1 week from request to proceed

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United States Environmental Protection Agency  
Washington, DC 20460

Work Assignment Number

2-1

## Work Assignment

☐ Original ☒ Amendment Number: 1Contract Number  
EP-W-08-018Contract Period  
Base

Option Period Number: ||

Title of Work Assignment  
IPM Architecture Maintenance and  
EnhancementContractor  
CF SERVICES COMPANY, L.L.C.

Specify Section and Paragraph of Contract SOW

Purpose: ☐ Work Assignment Initiation ☐ Work Assignment Close-Out  
☒ Work Assignment Amendment ☐ Incremental Funding  
☒ Work Plan Approval

Periods of Performance

From: 03/11/10

To: 03/10/11

Comments:

The purpose of this amendment is to approve, in full, the contractor's work plan dated March 31, 2010. However, an initial LOE ceiling of 3100 hours and an initial Cost/Fee ceiling of \$400,000 shall not be exceeded without prior written approval of the Contracting Officer.

☐ Superfund

## Accounting and Appropriations Data

☒ Non-Superfund

Line	DC (Max 6)	Budget/FYs (Max 4)	Appropriation Code (Max 6)	Budget Org/Code (Max 7)	Program Element (Max 9)	Object Class	Amount	(Dollars)	(Cents)	Site/Project (Max 8)	Cost Org/Code (Max 7)
1											
2											
3											
4											
5											

## Authorized Work Assignment Ceiling

Contract Period:	Cost/Fee	LOE
Previously Approved	\$0.00	13,400
This Action	\$1,860,488.00	0
Total	\$1,860,488.00	13,400

## Work Plan / Cost Estimate Approvals

Contractor WP Dated :03/31/10	Cost/Fee: \$1,860,488.00	LOE: 13,400
Cumulative Approved:	Cost/Fee: \$1,860,488.00	LOE: 13,400

Work Assignment Manager Name

ELLIOT R. LIEBERMAN

Branch/Mail Code

Phone Number

Fax Number

(Signature)

(Date)

Project Officer Name

RYAN T. DANIELS

Branch/Mail Code

Phone Number

Fax Number

(Signature)

(Date)

Other Agency Official Name

DEBRA A. MILLER

Branch/Mail Code 3803R

Phone Number 202-564-1041

Fax Number

(Signature)

(Date)

Contracting Official Name

DEBRA A. MILLER

Branch/Mail Code 3803R

Phone Number 202-564-1041

Fax Number

(Signature)

(Date)

Contractor Acknowledgement of Receipt and Approval of Workplan (Signature and Title)

Date

# IPM Architecture Maintenance and Enhancement

Contract: EP-W-08-018, Work Assignment: 2-1, Amendment: 0001

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## Summary Information

Title: IPM Architecture Maintenance and Enhancement  
Period of Performance: From: 03/11/10  
To: 03/10/11  
Award Date: 03/10/10  
Total Funding:

## WA Totals

*The following item(s) have been added:*

Category	POP	Amount
Estimated Cost	Option 2	\$ (b)(4)
Fixed Fee	Option 2	

United States Environmental Protection Agency  
Washington, DC 20460

Work Assignment Number

2-1

## Work Assignment

☐ Original ☒ Amendment Number: 2Contract Number  
EP-W-08-018Contract Period  
Base

Option Period Number: 1

Title of Work Assignment  
IPM Architecture Maintenance and  
EnhancementContractor  
ICF SERVICES COMPANY, L.L.C.

Specify Section and Paragraph of Contract SOW

Purpose: ☐ Work Assignment Initiation ☐ Work Assignment Close-Out  
☒ Work Assignment Amendment ☐ Incremental Funding  
☐ Work Plan Approval

Periods of Performance

From: 03/11/10

To: 03/10/11

Comments:

The purpose of this amendment is to raise the LOE ceiling to 6465 and to raise the cost ceiling \$857,000.00. The contractor shall not exceed this ceiling without prior written approval of the Contracting Officer.

☐ Superfund

## Accounting and Appropriations Data

☒ Non-Superfund

Line	DC (Max 6)	Budget/FYs (Max 4)	Appropriation Code (Max 6)	Budget Org/Code (Max 7)	Program Element (Max 9)	Object Class	Amount	(Dollars)	(Cents)	Site/Project (Max 8)	Cost Org/Code (Max 7)
1											
2											
3											
4											
5											

## Authorized Work Assignment Ceiling

Contract Period:	Cost/Fee	LOE
Previously Approved	\$1,860,488.00	13,400
This Action	\$0.00	0
Total	\$1,860,488.00	13,400

## Work Plan / Cost Estimate Approvals

Contractor WP Dated :	Cost/Fee: \$1,860,488.00	LOE: 13,400
Cumulative Approved:	Cost/Fee: \$1,860,488.00	LOE: 13,400

Work Assignment Manager Name

ELLIOT R. LIEBERMAN

(Signature)

(Date)

Branch/Mail Code

Phone Number

Fax Number

Project Officer Name

RYAN T. DANIELS

(Signature)

(Date)

Branch/Mail Code

Phone Number

Fax Number

Other Agency Official Name

DEBRA A. MILLER

(Signature)

(Date)

Branch/Mail Code 3803R

Phone Number 202-564-1041

Fax Number

Contracting Official Name

DEBRA A. MILLER

(Signature)

(Date)

Branch/Mail Code 3803R

Phone Number 202-564-1041

Fax Number

Contractor Acknowledgement of Receipt and Approval of Workplan (Signature and Title)

Date

# IPM Architecture Maintenance and Enhancement

Contract: EP-W-08-018, Work Assignment: 2-1, Amendment: 0002

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## Summary Information

Title: IPM Architecture Maintenance and Enhancement  
Period of Performance: From: 03/11/10  
To: 03/10/11  
Award Date: 03/10/10  
Total Funding:

United States Environmental Protection Agency  
Washington, DC 20460**Work Assignment**

Work Assignment Number

2-1

☐ Original ☒ Amendment Number: 3Contract Number  
EP-W-08-018Contract Period  
Base

Option Period Number II

Title of Work Assignment  
IPM Architecture Maintenance and  
EnhancementContractor  
ICF SERVICES COMPANY, L.L.C.

Specify Section and Paragraph of Contract SOW

Purpose: ☐ Work Assignment Initiation ☐ Work Assignment Close-Out  
☒ Work Assignment Amendment ☐ Incremental Funding  
☐ Work Plan Approval

Periods of Performance

From: 03/11/10

To: 03/10/11

Comments:

The purpose of this amendment is to raise the LOE ceiling to 12,042 hours and to raise the cost ceiling to \$1,632,093.18. The contractor shall not exceed either ceiling without the prior written consent of the Contracting Officer.

☐ Superfund**Accounting and Appropriations Data**☒ Non-Superfund

Line	DC (Max 6)	Budget/FYs (Max 4)	Appropriation Code (Max 6)	Budget Org/Code (Max 7)	Program Element (Max 9)	Object Class	Amount	(Dollars)	(Cents)	Site/Project (Max 8)	Cost Org/Code (Max 7)
1											
2											
3											
4											
5											

**Authorized Work Assignment Ceiling**

Contract Period:	Cost/Fee	LOE
Previously Approved	\$1,860,488.00	13,400
This Action	\$0.00	0
Total	\$1,860,488.00	13,400

**Work Plan / Cost Estimate Approvals**

Contractor WP Dated : 03/31/10	Cost/Fee: \$1,860,488.00	LOE: 13,400
Cumulative Approved:	Cost/Fee: \$1,860,488.00	LOE: 13,400

Work Assignment Manager Name

ELLIOT R. LIEBERMAN

(Signature)

(Date)

Branch/Mail Code

Phone Number

Fax Number

Project Officer Name

RYAN T. DANIELS

(Signature)

(Date)

Branch/Mail Code

Phone Number

Fax Number

Other Agency Official Name

DEBRA A. MILLER

(Signature)

(Date)

Branch/Mail Code 3803R

Phone Number 202-564-1041

Fax Number

Contracting Official Name

DEBRA A. MILLER

(Signature)

(Date)

Branch/Mail Code 3803R

Phone Number 202-564-1041

Fax Number

Contractor Acknowledgement of Receipt and Approval of Workplan (Signature and Title)

Date



# IPM Architecture Maintenance and Enhancement

Contract: EP-W-08-018, Work Assignment: 2-1, Amendment: 0003

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## Summary Information

Title: IPM Architecture Maintenance and Enhancement  
Period of Performance: From: 03/11/10  
To: 03/10/11  
Award Date: 03/10/10  
Total Funding:

United States Environmental Protection Agency  
Washington, DC 20460

## Work Assignment

Work Assignment Number

2-1

☐ Original ☒ Amendment Number: 4Contract Number  
EP-W-08-018Contract Period  
Base

Option Period Number||

Title of Work Assignment  
IPM Architecture Maintenance and  
EnhancementContractor  
ICF SERVICES COMPANY, L.L.C.

Specify Section and Paragraph of Contract SOW

Purpose: ☐ Work Assignment Initiation ☐ Work Assignment Close-Out  
☒ Work Assignment Amendment ☐ Incremental Funding  
☐ Work Plan Approval

Periods of Performance

From: 03/11/10

To: 03/10/11

Comments:

The purpose of this amendment is to raise the LOE ceiling to 13,400 LOE hours and the cost ceiling to \$1,860,488.00, the full amounts approved in the Contractor's work plan and cost estimate.

☐ Superfund

## Accounting and Appropriations Data

☒ Non-Superfund

Line	DC (Max 6)	Budget/FYs (Max 4)	Appropriation Code (Max 6)	Budget Org/Code (Max 7)	Program Element (Max 9)	Object Class	Amount	(Dollars)	(Cents)	Site/Project (Max 8)	Cost Org/Code (Max 7)
1											
2											
3											
4											
5											

## Authorized Work Assignment Ceiling

Contract Period:	Cost/Fee	LOE
Previously Approved	\$1,860,488.00	13,400
This Action	\$0.00	0
Total	\$1,860,488.00	13,400

## Work Plan / Cost Estimate Approvals

Contractor WP Dated: 03/31/10	Cost/Fee: \$1,860,488.00	LOE: 13,400
Cumulative Approved:	Cost/Fee: \$1,860,488.00	LOE: 13,400

Work Assignment Manager Name

ELLIOT R. LIEBERMAN

Branch/Mail Code

Phone Number

Fax Number

(Signature)

(Date)

Project Officer Name

RYAN T. DANIELS

Branch/Mail Code

Phone Number

Fax Number

(Signature)

(Date)

Other Agency Official Name

DEBRA A. MILLER

Branch/Mail Code 3803R

Phone Number 202-564-1041

Fax Number

(Signature)

(Date)

Contracting Official Name

DEBRA A. MILLER

Branch/Mail Code 3803R

Phone Number 202-564-1041

Fax Number

(Signature)

(Date)

Contractor Acknowledgement of Receipt and Approval of Workplan (Signature and Title)

Date

# IPM Architecture Maintenance and Enhancement

Contract: EP-W-08-018, Work Assignment: 2-1, Amendment: 0004.

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## Summary Information

Title: IPM Architecture Maintenance and Enhancement  
Period of Performance: From: 03/11/10  
To: 03/10/11  
Award Date: 03/10/10  
Total Funding:

Unit: Environmental Protection Agency  
Washington, DC 20460

Work Assignment Number

2-1

## Work Assignment

☐ Original ☒ Amendment Number: 5Contract Number  
EP-W-08-018Contract Period  
Base

Option Period Number[]

Title of Work Assignment  
IPM Architecture Maintenance and  
EnhancementContractor  
ICF SERVICES COMPANY, L.L.C.

Specify Section and Paragraph of Contract SOW

Purpose: ☐ Work Assignment Initiation ☐ Work Assignment Close-Out  
☒ Work Assignment Amendment ☐ Incremental Funding  
☐ Work Plan Approval

Periods of Performance

From: 03/11/10

To: 03/10/11

Comments:

The purpose of this amendment is to request a revised work plan and cost estimate in accordance with the attached Statement of Work. However, only an initial Level of Effort of 2,125 labor hours, of the additional 5,500 labor hours, is authorized. The Contractor shall not exceed this ceiling without prior written approval of the Contracting Officer.

☐ Superfund

## Accounting and Appropriations Data

☒ Non-Superfund

Line	DC (Max 6)	Budget/FYs (Max 4)	Appropriation Code (Max 6)	Budget Org/Code (Max 7)	Program Element (Max 9)	Object Class	Amount	(Dollars)	(Cents)	Site/Project (Max 8)	Cost Org/Code (Max 7)
1											
2											
3											
4											
5											

## Authorized Work Assignment Ceiling

Contract Period:	Cost/Fee	LOE
Previously Approved	\$1,860,488.00	13,400
This Action	\$0.00	5,500
Total	\$1,860,488.00	18,900

## Work Plan / Cost Estimate Approvals

Contractor WP Dated: 03/31/10	Cost/Fee: \$1,860,488.00	LOE: 18,900
Cumulative Approved:	Cost/Fee: \$1,860,488.00	LOE: 18,900

Work Assignment Manager Name  
ELLIOT R. LIEBERMAN

Branch/Mail Code

Phone Number

Fax Number

(Signature)

(Date)

Project Officer Name

RYAN T. DANIELS

Branch/Mail Code

Phone Number

Fax Number

(Signature)

(Date)

Other Agency Official Name

DEBRA A. MILLER

Branch/Mail Code 3803R

Phone Number 202-564-1041

Fax Number

(Signature)

(Date)

Contracting Official Name

DEBRA A. MILLER

Branch/Mail Code 3803R

Phone Number 202-564-1041

Fax Number

(Signature)

(Date)

Contractor Acknowledgement of Receipt and Approval of Workplan (Signature and Title)

Date

# IPM Architecture Maintenance and Enhancement

Contract: EP-W-08-018, Work Assignment: 2-1, Amendment: 0005

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## Summary Information

Title: IPM Architecture Maintenance and Enhancement  
Period of Performance: From: 03/11/10  
To: 03/10/11  
Award Date: 03/10/10  
Total Funding:

## Attachments

*The following item(s) have been added:*

Attachment Name

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Revised Statement of Work I

## WA Classification

*The following changes have occurred:*

The Labor Hour Ceiling has changed from 13400 to 18900.

**WORK ASSIGNMENT  
STATEMENT OF WORK**

**Title:** IPM Architecture Maintenance and Enhancement

**Contractor and Contract #:** EP-W-08-018 (ICF)

**Work Assignment #:** 2-1

**Estimated Level of Effort:** 5,500

**EPA Key Personnel:**

**Work Assignment Manager (WAM):**

Elliot Lieberman  
1200 Pennsylvania Avenue, NW  
Washington, D.C. 20460  
Mail Code: 6204J  
Phone: (202) 343 9136  
Fax: (202) 343 2359  
Email: [lieberman.elliott@epa.gov](mailto:lieberman.elliott@epa.gov)

**Project Officer (PO):**

Ryan Daniels  
Contract Specialist  
1200 Pennsylvania Avenue, NW (3803R)  
Washington, D.C. 20460  
Phone: 202-564-6476  
Fax: 202-565-2554  
Email: [daniels.ryan@epa.gov](mailto:daniels.ryan@epa.gov)

**I. BACKGROUND AND PURPOSE**

Due to an accelerated schedule for release of the Clean Air Transport Rule (CATR) and activities related to Maximum Achievable Technology regulations for the electric power sector (Utility MACT), the schedule for developing a new draft of the IPM base case was also accelerated so that activities that had previously been expected to be completed by the end of Option Period 2 had to be completed approximately 3 months ahead of schedule. Specifically, a Notice of Data Availability (NODA) was issued in the Federal Register on August 30, 2010. Posted on EPA's web site, the NODA announcement made available outputs from and documentation for the preliminary IPM v.4.10 base case developed under this work assignment. It also included a request for submission of public comments on the IPM base case and documentation by October 15, 2010.

As a result of public comments received, the Agency is directing the Contractor to revise the preliminary base case and prepare a final base to be used in modeling the final CATR which is scheduled for signature by the EPA Administrator in June 2011. The final IPM base case will also be used in modeling the Utility MACT regulations, climate change analysis, and electric sector reliability assessments.

## Revised Statement of Work

Contract: EP-W-08-018, Work Assignment: 2-1, Amendment: 0005

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This amendment to WA 2-1 will provide the additional LOE and funding needed to carry out this work. None of the work performed under this work assignment amendment will duplicate work previously performed under this or other work assignments or task orders.

### II. CONTRACT LEVEL STATEMENT OF WORK REFERENCE

The tasks to be performed under this work assignment are consistent with the provisions of Attachment 1 (Statement of Work) for Contract EP-W-08-018.

### III. STATEMENT OF WORK TASKS

This amendment will require performing the same categories of activities as identified in the original SOW for WA 2-1. Described below are specific activities under the Task 1-14 that will be required under this amendment.

**Task 1— Prepare Work Plan:** In accordance with the terms and conditions of contract clause B.2 entitled “Work Assignments” and the section of contract Attachment 1 entitled “Preparation and Submission of Work Plans,” the Contractor shall prepare a Work Plan and Cost Estimate in accordance with the revised Statement of Work. The contractor shall prepare a work plan and cost estimate for the full 5,500 LOE hours. However, the Government will only approve a LOE of 2,125 hours on a prorated basis to begin work under Amendment No. 5.

Note: If development work on non-U.S. IPM modules are performed under the tasks below, the contractor upon request from EPA shall report total monthly and cumulative hours separately for IPM U.S. and the non-U.S in the contractor’s standard monthly “Financial Detail Task Order Report.”

#### **Task 2 — Design, Programming, Testing, and Implementation of Selected Updates and Enhancements of IPM**

The Contractor shall perform the type of activities described in the original SOW for this task. See: Statement of Work.

For the purposes of budgeting, the Contractor shall assume that under this amendment the COR will request 2-3 issue papers on functional areas identified by the COR and two to four (2-4) diagnostic model runs.

#### **Task 3 — Model Enhancements to Support Analysis of New Environmental Initiatives:**

The Contractor shall perform the type of activities described in the original SOW for this task. See: Statement of Work.

One activity area that will receive particular attention under this amendment will be providing enhanced capability to model the impact of environment initiatives (e.g., utility MACT regulation) on power system reliability. For this activity the contractor shall propose and (with WAM approval) implement enhancements to IPM needed to pass IPM outputs to the GE Multi-Area Production Simulation Software (GE MAPS), an electric sector transmission model with hour-by-hour unit commitment capabilities. The contractor shall run GE MAPS to assess such reliability issues as deliverability impacts on the transmission system and the effects of variations in planned maintenance on reliability. Based on preliminary GE MAPS results, the contractor shall implement



further enhancements of IPM and re-run GE MAPS as required. The contractor shall prepare a 10-20 page technical memorandum and 10-30 presentation slides on this work.

Besides the technical memorandum described in the preceding paragraph, the contractor shall prepare one (1) additional 10-20 page technical memorandum for 1-2 other model enhancements identified by the WAM and perform one to three (1-3) diagnostic model runs to test and debug the enhancement(s).

#### **Task 4 — Reporting Improvements**

The Contractor shall perform the type of activities described in the original SOW for this task. See: Statement of Work.

This task shall include continuing technical support for EPA's effort to pass IPM outputs to and receive inputs from other models including energy-sector-wide models (like the Energy Information Administration's National Energy Modeling System (NEMS) model), computable general equilibrium (CGE) models (like the Applied Dynamic Analysis of the Global Economy (ADAGE) model), and electric sector transmission models (like GE MAPS).

The technical support activities for Amendment 5 shall include providing input and output files from previously performed model runs and participation in 2-3 one-hour telephone meetings on topics related to this task.

#### **Task 5 — Parsing and Post-Processing Tool Improvement**

The Contractor shall perform the type of activities described in the original SOW for this task. See: Statement of Work.

Under this amendment the Contractor shall provide technical support to address parsing and post-processing issues that were not previously resolved under the work assignment.

#### **Task 6 — Validation Evaluations**

The Contractor shall perform the type of activities described in the original SOW for this task. See: Statement of Work.

Under this amendment the Contractor shall perform validation evaluations that were not previously completed under the work assignment.

#### **Task 7 — Documentation**

The Contractor shall perform the type of activities described in the original SOW for this task. See: Statement of Work.

The Contractor shall provide corrections to the IPM v.4.10 documentation that was released on August 30, 2010, and prepare additional documentation items (i.e., tables, figures, and limited text) for new features included in the final v.4.10 Base Case. For purposes of budgeting the Contractor shall assume that the v.4.0

documentation materials required under this amendment shall include a limited number of additional items (i.e., approximately 10) beyond those previously delivered under Work Assignment 2-1.

**Task 8 — Model Size and Speed Assessment and Upgrade**

The Contractor shall perform the type of activities described in the original SOW for this task. See: Statement of Work.

This includes ongoing assessments of available hardware and software upgrades required to keep run time below 8 hours for the final IPM v.4.10 Base Case that is prepared under this amendment.

**Task 9 — Performing Model Runs**

The Contractor shall perform the type of activities described in the original SOW for this task. See: Statement of Work.

Under this amendment the contractor shall perform 15 additional diagnostic IPM runs in the course of the activities described above in Tasks 2-4. For each model run, the Contractor shall provide the WAM with run specifications, input (e.g., DAT and EMS files) and output report files (e.g., System Summary Reports, RPT and RPE files)

**Task 10 — Parsing and Post-Processing Results from Model Runs**

The Contractor shall perform the type of activities described in the original SOW for this task. See: Statement of Work.

The Contractor shall perform two to four (2-4) parsings and post-processings of IPM run outputs produced under Task 9. As previously, the WAM will identify the runs and run years to be used. The Contractor shall deliver the parsed and ORL (one record line) files within three (3) working days after a request to proceed.

**Task 11 — Expert Panels, Work Groups, and Special Studies**

The Contractor shall perform the type of activities described in the original SOW for this task. See: Statement of Work.

Under this amendment the activities on this task shall apply to up to two (2) topic areas to be identified by the WAM.

**Task 12 — Technical Support for Peer Review of IPM**

The Contractor shall perform the type of activities described in the original SOW for this task. See: Statement of Work.

This shall include up to two peer reviews of key assumptions in the final version of the IPM v.4.10 base case. The specific topics of these peer reviews will be identified by the WAM.

**Task 13 — Quality Assurance and Quality Control Activities**

## **Revised Statement of Work**

Contract: EP-W-08-018, Work Assignment: 2-1, Amendment: 0005

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The Contractor shall perform the type of activities described in the original SOW for this task. See: Statement of Work.

Since ongoing QA/QC is an agency requirement, the contractor shall perform the same level of QA/QC as previously provided under this work assignment

### **Task 14 — Conferences and Comparative Modeling Workshops**

The Contractor shall perform the type of activities described in the original SOW for this task. See: Statement of Work.

The Contractor shall provide one staff member to participate in up to one conference and provide the type of technical support described in the original SOW for this task. For purposes of budgeting, the Contractor shall assume that the conference is three days in duration and in a location on the U.S. West coast.

## **IV. DELIVERABLES**

Under this amendment the contractor shall participate by phone in weekly Architecture Status Meetings, one to two (1-2) hours in length.

Note: All electronic deliverables required under this work assignment shall be emailed to the WAM and/or posted on the contractor's FTP site for downloading. The contractor shall also provide electronic versions of all deliverables on CD-ROM disks at the conclusion of the work assignment. The disk(s) will be accompanied by a hard copy index of all items contained on the disk(s).

### **Task 1: Work Plan**

In accordance with clauses B.2 and Attachment 1 of the contract

### **Task 2: Design, programming, testing and implementation of selected updates and enhancements of IPM**

Six to eight 5-15 page issue papers	3 weeks from request to proceed
Input and output files from two to four (2-4) diagnostic runs	4 weeks from request to proceed
NEEDS Comment Tracking Tool - Round 1 Revision	4 weeks from request to proceed
NEEDS Comment Tracking Tool - Round 2 Revision	4 weeks from request to proceed

### **Task 3: Model Enhancements to Support Analysis of New Environmental Initiatives**

Two (2) 10-20 page technical Memoranda	3 weeks from request to proceed
--	---------------------------------

## **Revised Statement of Work**

Contract: EP-W-08-018, Work Assignment: 2-1, Amendment: 000

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Slide presentation consisting of 10-30 slides	2 weeks from request to proceed
Input and output files from 1-3 diagnostic runs	4 weeks from request to proceed

### **Task 4: Reporting Improvements**

1 draft reporting improvement prototype	5 weeks from request to proceed
1 operational reporting improvement prototype	8 weeks after obtaining feedback on draft prototypes
12-4 model runs and accompanying data files for testing data exchange and coordinated modeling with IPM and NEMS	1 week from request to proceed for each trial run

### **Task 5: Parsing and Post-Processing Tool Improvements**

One (1) 5-10 page technical memorandum	4 weeks from request to proceed
Parsed output files from two (2) diagnostic runs	4 weeks from request to proceed
Two (2) draft and one (1) final one record line (ORL) post-processing output files	6, 8, and 10 weeks from request to proceed respectively

### **Task 6: Validation and Uncertainty Evaluations**

Input and output files from validation runs	4 weeks from EPA approval of validation proposal
One (1) technical memorandum (5-15 pages) summarizing results of validation	3 weeks from completion of validation runs

### **Task 7: Documentation**

(Note: The following activities will be performed for revisions and additions to the documentation report released on August 30, 2010 under this work assignment.

Tables, figures and limited text for documentation report	Ongoing for 6-12 weeks after finalizing outline
First and second mark-ups of revised documentation report	2 weeks from receipt of each draft report

### **Task 8: Model Size and Speed Assessment and Upgrade**

Telephone briefing on available options	One briefing by phone in the period remaining under this
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amendment. Can be included as part of Architecture Status meetings

Implementation of size and speed improvements.

One time in the period remaining under this amendment

**Task 9: Performing Model Runs**

Specification for each of fifteen (15) runs

1 day from request to proceed

Input and output files and updated run log for each of fifteen (15) model runs

3 days from request to proceed

**Task 10: Parsing results from model runs**

Spreadsheet files containing fully quality assured, parsed results for two to four (2-4) parsings of IPM output files

3 days after request to proceed

**Task 11: Expert Panels, Work Groups, and Special Studies**

The following shall be prepared for up to 3 technical topic areas;

Draft and final technical specifications on issues and questions to be addressed by experts

3 weeks from request to proceed

List of candidates with required expertise

3 weeks from request to proceed

Estimate of cost, level of effort, and delivery schedule

3 weeks from request to proceed

Data and other information required for incorporation in IPM

4 weeks from request to proceed

Data and documentation required for public release and peer review

6 weeks from request to proceed

**Task 12: Technical Support for Peer Review of IPM**

Two (2) presentations (approximately 40 slides or overheads each)

3 weeks from request to proceed

Two (2) summaries of comments (10-20 page each)

1 week after each peer review meeting

Three (2) response documents (20-30 page each)

2 weeks after each peer review meeting

## Revised Statement of Work

Contract: EP-W-08-018, Work Assignment: 2-1, Amendment: 0005

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### **Task 13: Quality Assurance and Control Activities**

Summary of QA/QC activities performed	Monthly by phone as part of Architecture Status meetings
5-15 page technical memorandum this Work Assignment	No less than 10 days before the end of option period 2 for this Work Assignment

### **Task 14: Conferences and Comparative Modeling Workshops**

One (1) presentation (consisting of approximately 40 slides)	3 weeks after request to proceed
Three (3) 1-2 page response to questions on previously performed model runs	3 days from request to proceed
1-2 addition model runs related to conference presentation	1 week from request to proceed

United States Environmental Protection Agency  
Washington, DC 20460Work Assignment Number  
2-1

## Work Assignment

[ ] Original [X] Amendment Number: 6

Contract Number  
EP-W-08-018Contract Period  
Base

Option Period Number II

Title of Work Assignment  
IPM Architecture Maintenance and EnhancementContractor  
CF SERVICES COMPANY, L.L.C.

Specify Section and Paragraph of Contract SOW

Purpose: [ ] Work Assignment Initiation [ ] Work Assignment Close-Out  
[X] Work Assignment Amendment [ ] Incremental Funding  
[X] Work Plan Approval

Periods of Performance

From: 03/11/10

To: 03/10/11

Comments:

The purpose of this amendment is to approve the contractor's work plan and cost estimate dated November 30, 2010. However, the contractor shall not exceed a LOE labor hour ceiling of 15,555 hours without prior written approval of the Contracting Officer.

[ ] Superfund

## Accounting and Appropriations Data

[X] Non-Superfund

Line	DC (Max 6)	Budget/FYs (Max 4)	Appropriation Code (Max 6)	Budget Org/Code (Max 7)	Program Element (Max 9)	Object Class	Amount	(Dollars)	(Cents)	Site/Project (Max 8)	Cost Org/Code (Max 7)
1											
2											
3											
4											
5											

## Authorized Work Assignment Ceiling

Contract Period:  
Previously ApprovedCost/Fee  
\$1,860,488.00LOE  
18900

This Action

\$772,332.00

0

Total

\$2,632,820.00

18900

## Work Plan / Cost Estimate Approvals

Contractor WP Dated: 11/30/2010

Cost/Fee: \$2,632,820.00

LOE: 18900

Cumulative Approved:

Cost/Fee: \$2,632,820.00

LOE: 18900

Work Assignment Manager Name

ELLIOT R. LIEBERMAN

Branch/Mail Code

Phone Number

Fax Number

(Signature)

(Date)

Project Officer Name

RYAN T. DANIELS

Branch/Mail Code

Phone Number

Fax Number

(Signature)

(Date)

Other Agency Official Name

DEBRA A. MILLER

Branch/Mail Code 3803R

Phone Number 202-564-1041

Fax Number

(Signature)

(Date)

Contracting Official Name

DEBRA A. MILLER

Branch/Mail Code 3803R

Phone Number 202-564-1041

Fax Number

(Signature)

(Date)

Contractor Acknowledgement of Receipt and Approval of Workplan (Signature and Title)

Date



United States Environmental Protection Agency  
Washington, DC 20460

Work Assignment Number

2-1

**Work Assignment**

[ ] Original [X] Amendment Number: 7

Contract Number  
EP-W-08-018Contract Period  
Base

Option Period Number II

Title of Work Assignment  
IPM Architecture Maintenance and EnhancementContractor  
ICF SERVICES COMPANY, L.L.C.

Specify Section and Paragraph of Contract SOW

Purpose: [ ] Work Assignment Initiation [ ] Work Assignment Close-Out  
[X] Work Assignment Amendment [ ] Incremental Funding  
[ ] Work Plan Approval

Periods of Performance

From: 03/11/10

To: 03/10/11

Comments:

The purpose of this modification is to raise the LOE and Cost/Fee ceilings to the fully approved work plan amounts.

[ ] Superfund

**Accounting and Appropriations Data**

[X] Non-Superfund

Line	DC (Max 5)	Budget/FYs (Max 4)	Appropriation Code (Max 6)	Budget Org/Code (Max 7)	Program Element (Max 9)	Object Class	Amount	(Dollars)	(Cents)	Site/Project (Max 8)	Cost Org/Code (Max 7)
1											
2											
3											
4											
5											

**Authorized Work Assignment Ceiling**

Contract Period:	Cost/Fee	LOE
Previously Approved	\$2,632,820.00	18900
This Action	\$0.00	0
Total	\$2,632,820.00	18900

**Work Plan / Cost Estimate Approvals**

Contractor WP Dated: 11/30/2010	Cost/Fee: \$2,632,820.00	LOE: 18900
Cumulative Approved:	Cost/Fee: \$2,632,820.00	LOE: 18900

Work Assignment Manager Name

ELLIOT R. LIEBERMAN

Branch/Mail Code

Phone Number

Fax Number

(Signature)

(Date)

Project Officer Name

RYAN T. DANIELS

Branch/Mail Code

Phone Number

Fax Number

(Signature)

(Date)

Other Agency Official Name

DEBRA A. MILLER

Branch/Mail Code 3803R

Phone Number 202-564-1041

Fax Number

(Signature)

(Date)

Contracting Official Name

DEBRA A. MILLER

Branch/Mail Code 3803R

Phone Number 202-564-1041

Fax Number

(Signature)

(Date)

Contractor Acknowledgement of Receipt and Approval of Workplan (Signature and Title)

Date



United States Environmental Protection Agency  
Washington, DC 20460

## Work Assignment

Work Assignment Number

2-2

☒ Original ☐ Amendment Number:

Contract Number  
EP-W-08-018

Contract Period  
Base

Option Period Number

Title of Work Assignment  
Technical Support for Clean Air Markets  
Division Regulatory Development Activities

Contractor  
ICF SERVICES COMPANY, L.L.C.

Specify Section and Paragraph of Contract SOW

Purpose: ☒ Work Assignment Initiation ☐ Work Assignment Close-Out  
☐ Work Assignment Amendment ☐ Incremental Funding  
☐ Work Plan Approval

Periods of Performance

From: 03/11/10

To: 03/10/11

Comments:

The contractor shall prepare a work plan and cost estimate in accordance with the attached Statement of Work. However, the Government intends to incrementally fund the work assignment and to authorize lower Cost/Fee and LOE hour ceilings, including an initial 1800 LOE hours..

☐ Superfund

### Accounting and Appropriations Data

☒ Non-Superfund

Line	DC (Max 6)	Budget/FYs (Max 4)	Appropriation Code (Max 6)	Budget Org/Code (Max 7)	Program Element (Max 9)	Object Class	Amount	(Dollars)	(Cents)	Site/Project (Max 8)	Cost Org/Code (Max 7)
1											
2											
3											
4											
5											

### Authorized Work Assignment Ceiling

Contract Period:

Cost/Fee

LOE

Previously Approved

This Action

Total \$0.00

9,000

### Work Plan / Cost Estimate Approvals

Contractor WP Dated :

Cost/Fee:

LOE:

Cumulative Approved:

Cost/Fee: \$0.00

LOE: 9,000

Work Assignment Manager Name

GENE-HUA SUN

(Signature)

(Date)

Branch/Mail Code

Phone Number

Fax Number

Project Officer Name

RYAN T. DANIELS

(Signature)

(Date)

Branch/Mail Code

Phone Number

Fax Number

Other Agency Official Name

DEBRA A. MILLER

(Signature)

(Date)

Branch/Mail Code 3803R

Phone Number 202-564-1041

Fax Number

Contracting Official Name

DEBRA A. MILLER

(Signature)

(Date)

Branch/Mail Code 3803R

Phone Number 202-564-1041

Fax Number

Contractor Acknowledgement of Receipt and Approval of Workplan (Signature and Title)

Date

# Technical Support for Clean Air Markets Division Regulatory Development Activities

Contract: EP-W-08-018, Work Assignment: 2-2

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## Summary Information

Title: Technical Support for Clean Air Markets Division  
Regulatory Development Activities

Period of Performance: From: 03/11/10  
To: 03/10/11

Award Date:

Total Funding:

## Procurement Management Roles

WORK ASSIGNMENT MANAGER:

U.S. E.P.A.  
Attn: GENE-HUA SUN  
1200 PENNSYLVANIA AVE, NW  
WASHINGTON, DC 20460

Mail Code:  
Phone Number:  
Fax Number:  
E-Mail Address: sun.gene-hua@epa.gov

## Attachments

Attachment Name

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Technical Support for Clean Air Markets Division Regulatory  
Development Activities SOW

# **Technical Support for Clean Air Markets Division Regulatory Development Activities SOW**

Contract: EP-W-08-018, Work Assignment: 2-2

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## **WORK ASSIGNMENT STATEMENT OF WORK**

**Title:** Technical Support for Clean Air Markets Division Regulatory Development Activities in Option Year 1.

**Contractor and Contract #:** EP-W-08-018

**Work Assignment #:** To Be Determined

**Estimated Level of Effort:** 9000 LOE hours. However, the Government expects to incrementally fund the work assignment and to authorize lower Cost/Fee and LOE hour ceilings, including 1800 LOE hours initially.

**Duration:** March 11, 2010 - March 10, 2011

**EPA Key Personnel:**

**Work Assignment Contracting Officer's Representative (WACOR):**

Gene-Hua Sun  
USEPA/OAR/OAP/CAMD/PDB, 6204J  
Ariel Rios Building  
1200 Pennsylvania Avenue, N.W.  
Washington, DC 20460  
Phone: (202)343-9119  
Fax: (202)343-2359  
E-Mail: Sun.Gene-Hua@epa.gov

**Contracting Officer:**

Ryan Daniels  
1200 Pennsylvania Avenue, NW  
Washington, DC 20460  
Mail Code 3803 R  
Phone: (202) 564-6476  
Fax: (202) 565-2558  
E-mail: Daniels.Ryan@epa.gov

## **I. BACKGROUND AND PURPOSE**

This is the continuous effort, starting from Work Assignment 0-3 and 1-3 of this contract, to acquire the technical support from contractor in supporting CAMD/EPA regulatory development activities. Under this work assignment, the contractor shall use the developed "Integrated Planning Model (IPM) Version 3.0, 3.01, 3.02, 3.1, 4.0 and/or newer version to support the CAMD regulatory development activities by estimating the operational costs, emission reductions, and providing the technical analyses for the economic impacts to the electric power generating sector and users for current regulatory development under the multiple pollutant control strategy. Activities covered in this work assignment include modeling, analyses, and assessment in support of policy development, rulemaking, and impact evaluations related to power generation and other

# **Technical Support for Clean Air Markets Division Regulatory Development Activities SOW**

Contract: EP-W-08-018, Work Assignment: 2-2

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stationary sources, energy consumption, and the pollutants associated with the power sector and other stationary sources, including sulfur dioxide (SO<sub>2</sub>), nitrogen oxides (NO<sub>x</sub>), particulate matter (PM<sub>2.5</sub>), mercury (Hg), and other toxic air pollutants as well as emissions of carbon dioxide (CO<sub>2</sub>) and other greenhouse gases. Activities may be related to the development of the Replacement of Clean Air Interstate Rule (CAIR), and/or the proposal of air toxics standards for coal- and oil- fired electric generating units and finalize the rule under Clean Air Mercury Rule (CAMR), New Source Performance Standards (NSPS), New Source Review (NSR), Maximum Achievable Control Technology (MACT), or other regulatory actions, policy development, or legislative proposals."

Additionally, regulatory support activities also include work related to air quality improvement (NAAQS Review, State Implementation Plans (SIPs), air toxics (MACT reviews), and greenhouse gases (e.g., Federal voluntary programs to lower GHGs and development of cleaner technology, while States begin to address GHGs (e.g. RGGI, California, etc.) and Congress considers legislation (e.g., implementation of mandatory emissions reporting, Senate and House developing comprehensive legislation, etc.)).

In the past, air emissions from the power sector were regulated one pollutant at a time and the regulations were developed under various authorities. Industry has developed and implemented control technologies in incremental steps to mitigate emissions of SO<sub>2</sub>, NO<sub>x</sub>, particulate matter, and other pollutants, as driven by air pollution policies and regulations. Experience with the interactive effects of previous regulatory approaches, a better understanding of control technology synergies, growing knowledge about the co-benefits of controlling various combinations of pollutants, as well as the growing concern over the continuing environmental impacts of the power generating sector have lead to proposals for integrated approaches to control air emissions from the power generating sector. Most of these integrated approaches include the control of SO<sub>2</sub>, NO<sub>x</sub> and Hg emissions. Some of the multi-pollutant control technologies have reached a stage of development beyond pilot scale. Included are those technologies that integrate during- and/or post-combustion controls of at least two of the SO<sub>2</sub>, NO<sub>x</sub>, mercury pollutants, and CO<sub>2</sub> emissions, either in one process or a combination of coordinated and complementary processes. Some of the new coal-fired electricity-generating technologies, which are inherently more efficient than conventional coal-fired power plants, have the potential to generate lower emission of air pollutants and CO<sub>2</sub>.

Under this work assignment, the contractor shall implement the technical support effort from Contract EP-W-08-018 Optional Year 2 to:

- (1) Provide the technical and economic studies under the criteria established by the Work Assignment Contract Officer's Representative (WACOR) and CAMD technical staff to support routine EPA rule making processes;
- (2) Evaluate the operational cost and effects among the installed Air Pollutants Control Devices (APCDs), combustor efficiency improvement and its co-benefits on CO<sub>2</sub> reductions, and economic impacts under proposed multi-pollutant reduction rules for fossil fuel fired electric generating units;
- (3) Assess the feasibility and reliability of installing air pollution control technologies for proposed rules in the electric power generating sector under given time frames;
- (4) Assess the uncertainties associated with major parameters used in the IPM model to support CAMD regulatory development activities; and
- (5) Assist the administration in preparing white papers and Microsoft Power Point related slide presentations in

# **Technical Support for Clean Air Markets Division Regulatory Development Activities SOW**

Contract: EP-W-08-018, Work Assignment: 2-2

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answering Congressional and inter-agency demand and public comments related to the products generated from this work assignment.

## **II. CONTRACT LEVEL STATEMENT OF WORK REFERENCE**

The tasks to be performed under this work assignment are consistent with the areas of analyses authorized in sections A through I of the contract's Statement of Work:

## **III. STATEMENT OF WORK TASKS**

### **TASK 1: Prepare Work Plan**

The Contractor shall prepare a Work Plan for 9000 hours with the understanding that the Government will fund this work assignment in stages depending on the funds available and the technical support needed. The contractor shall not exceed the Cost/Fee and LOE hour ceilings without prior approval of the Contracting Officer.. This initial LOE will be set at 1800 LOE hours. The Government expects to require more than 1800 LOE hours to complete the work assignment but reserves the right to discontinue this task after exhausting the initial 1800 LOE hours. Deliverables shall be completed and submitted to EPA/OAR/OAP/CAMD as specified in this work assignment, except to the extent that content or dates are changed through the initiation or full agreement of EPA/OAR/OAP/CAMD. The contractor can use the results obtained from, but not duplicate services provided under Work Assignment 0-3, 1-3, and several work assignments from the previous contract.

The contractor shall expect to provide ad-hoc responses for not more than 35% of the LOE involvement. The allocation of effort required under each work area under this work assignment may vary during actual performance. The contractor shall closely work with the WACOR through the course of this work assignment to ensure the best of use of LOE under limited funds available . The contractor shall notify the WACOR when 90% of the work assignment hours or approved funding level has been accumulated in contractor's accounting system.

### **TASK 2: Regulation Compliance Costs Analysis to support CAMD/PDB for various Rule Making Processes**

The Contractor shall use the Integrated Planning Model (IPM) version 3.0, 4.0 and/or newer version in planning to estimate the national, regional and state compliance costs for the emission reductions established through various multipollutant reduction regulations as specified in the background section. The Agency estimates up to 80 IPM runs will be needed to support one year of the CAMD rule making procedures under this work assignment. The contractor shall expect to parse up to 25 % of these runs (i.e. up to 20 IPM runs) for detailed boiler level information to support EPA's technical studies. The WACOR will issue written requests for runs which need to be parsed when specific needs have been identified thru the work assignment order durations. These 80 IPM runs will be used to address the following specific areas:

1. Routine studies: Based on the emission caps established in different regulations and the newly available control cost information acquired during the course of this work assignment, CAMD will need specific IPM runs (e.g. under IPM version 3.0, 4.0 and/or newer version depending on the purpose of the study and the reference base case used for that study) to support CAMD technical studies in order to address issues related to policy development, economic impact assessment, interrogatories from inter- and/or intra-agency effort in rule development, responses to comments from Congressional committees and/or other environmental

# Technical Support for Clean Air Markets Division Regulatory Development Activities SOW

Contract: EP-W-08-018, Work Assignment: 2-2

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organizations, and the litigation of the regulations involved with CAMD regulatory development activities, (e.g., CAIR and/or CAMR and its Reconsideration(s)). The Agency also needs to conduct sensitivity, reliability, and feasibility studies for the electric power generating system in installing and/or retrofitting air pollution control devices available in the market for the electric power generating industry to use in compliance with air pollutant reduction regulations. The WACOR estimates that 30 IPM runs under this work assignment will be needed to address these routine studies. For routine analyses, the contractor shall deliver the study results from these IPM runs to the agency three weeks after receiving the written notice from the WACOR. The contractor shall expect that 25% of these routine IPM runs will be issued in an ad-hoc manner. Results from ad-hoc runs should be delivered to the WACOR within three days after receiving the WACOR's written requests. For each IPM run, the WACOR will work with CAMD technical staff to determine the input data criteria (i.e., allowable options, limiting parameters, reference base case or policy cases identification, emission caps, and specific constraints) for each IPM model run. These criteria and parameters will be generated based on: (1) The economic analyses needed to examine regulatory options, (2) Comments which the Agency received during the course of this work assignment, or (3) New information received during the CAIR and/or CAMR litigation processes. The contractor shall summarize and present to the WACOR the run specification by Excel style spreadsheet before each IPM run. Upon receiving the approval from the WACOR, the contractor shall perform these IPM runs. The contractor shall deliver results in the electronic and/or hard copy format according to the deliverable schedules specified in the WACOR's written request for the ad-hoc runs. For non-ad-hoc IPM runs, deliverables shall be delivered as specified in the deliverables schedules attached at the end of this Statement of Work.

2. Specific studies to support and/or to revise may include "Financial Analysis," "Potential Impacts Upon Employment in Other Economic Sectors," "Continuing Support in the Implementation of the National Energy Policy," "Support for Response to Congressional Requests," "Analysis of Impacts of Carbon Regulations," and "Costs, Performance, and Availability of Applicable NOx and SO2 Control Measures for Existing and New Cement Kilns in the U.S." Details of these analyses will be discussed in Task 3. The WACOR estimates that 25% of the IPM runs effort will be used in this category.
3. Studies to support "Analysis of Allowance Allocation Options". More detail of these runs will be discussed in Task 6. The WACOR estimates that 15% of the IPM runs will be used to support this category.
4. Potentially 6-12 studies will be required, in which the contractor shall analyze nuclear generation as it relates to overall electric generation. Analysis may include examining the economics of nuclear power generation, costs associated with nuclear re-licensing and/or life extension, and cost and performance of new nuclear generation.
5. Analyses to provide technical support for complimentary rulemakings for the power sector, including the litigation of the CAIR Reconsideration, any possible mercury legislation (which might be related to CAMR or MACT), Best Available Retrofit Technology (BART), and Maximum Achievable Control Technology (MACT) rule would affect such rule development and/or proposed legislation. The remaining portion of IPM runs will be used to support items 4 and 5 of this task.

For items 2 through 5, the WACOR will work with the CAMD technical staff to determine the allowable options and limiting parameters for each of the IPM model analyses. These options and parameters will also be generated based on: (1) The economic analyses needed to examine the regulatory option, (2) The specific studies generated from the Congressional request, or (3) Specific benefit analyses required for RIA. The



# **Technical Support for Clean Air Markets Division Regulatory Development Activities SOW**

Contract: EP-W-08-018, Work Assignment: 2-2

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WACOR will issue a written request to the contractor to specify these criteria and deliverable schedule. The contractor shall perform these IPM runs and deliver the results (i.e., electronic and/or hard copy) to the WACOR as specified in the written request. Other deliverable items not specified in the WACOR's written request shall be delivered as specified in the deliverables schedule attached at the end of this Statement of Work.

## **TASK 3: Technical Analyses and Documents Preparation for Regulatory Impact Analyses Related Rulemaking Processes**

In order to continue the support of the multi-pollutant reduction rule making efforts under CAIR, CAIR Litigation, any mercury rulemaking activities (that may include revisiting aspects of CAMR), NSR, Section 812 for the Title IV of the CAAA and/or CAIR, NSR settlements, NSPS, the Geological Sequestration Rule, and the GHG Inventory Rulemaking, the following technical analyses and documentation preparation may be required by the rule making processes:

1. **Financial Analyses:** in this area, when needed, the WACOR will issue a written request for the contractor to enhance the financial analyses originally developed by ICF in the previous contract (and subsequent work assignment(s)). The enhancement shall include the findings and specific data obtained in new IPM runs for the case studies specified in Task 2 of this Statement of Work. Topics which need to be updated include power plant economic and viability issues, market efficiency studies, and financial distress analyses. The financial analyses shall include the IPM run results which address the results from assumptions of different emissions control levels, alternative control performance, alternative fuel cost, projection of the types of new power plants on line, and alternative financial assumptions. The relationship developed between these new IPM runs and financial studies shall help the Government to determine the potential impacts on retail electricity prices, coal production, employment, and electricity generation at the State, regional and national levels. The contractor shall also provide the results of these studies to help the Agency to determine the financial impacts of the Best Available Retrofit Technology (BART) and Maximum Achievable Control Technology (MACT) to the rule development activities currently in progress.
2. Regarding the feasibility of installing air pollution control technologies, the contractor shall examine the time needed to install controls and the impact on electric reliability. The contractor shall assist the Agency to identify the control technology installations needed to meet the various emission cap levels for SO<sub>2</sub>, NO<sub>x</sub> and mercury by the expected time frame. Analysis shall examine the affects on the power utility sector reliability and boiler outage period for the installation of control technologies. Such efforts would assist CAMD in analyzing and assessing NO<sub>x</sub>, SO<sub>2</sub>, and mercury emission control science/testing and their respective parametric cost and performance. After receiving the WACOR's written request, the contractor shall provide the WACOR with the essential information to identify the hot spots (e.g. regions in the country which are projected to have higher percentages of control technology installations) and the time frame required for electrical power generation sector to install or retrofit these control technologies.
3. In the support of activities such as the response to Congressional, OMB, inter- or intra-agency requests, and comments received during the public comment periods, the contractor shall provide ad-hoc technical analyses to support the EPA in preparation documentation to respond to Congressional, OMB, and inter- or intra-agency requests for technical evaluation of information. In addition to using the IPM model (e.g. both version 3.0, 4.0 and/or newer version depending to the type of analyses), the contractor shall also first upgrade and use the off-line analysis tools, such as TRUM model which needs to be upgraded under this



# **Technical Support for Clean Air Markets Division Regulatory Development Activities SOW**

Contract: EP-W-08-018, Work Assignment: 2-2

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work assignment to match the IPM version 4.0 assumptions, to perform this sub-task. The contractor shall expect no more than ten (10) studies in this sub-task. When all of them need to be done by TRUM, the contract shall expect no more than 30% of these TRUM model run results will be requested by the WACOR's TD to be verified by full scale of the IPM model run. Draft reports resulting from these quick turn-around operations are due five (5) working days after receiving the WACOR's written request. Implementation of a new modeling platform to demonstrate potential air quality benefits available through energy efficiency measures on HEDDs will require 1) enabling IPM to output results at an hourly level, and 2) synchronizing IPM and the air quality modeling platform (CMAQ) in their use of meteorological data and energy demand data, 3) conducting two runs with and without energy efficient measures to analyze reduction in emission levels on HEDD days, and 4) preparing air quality modeling ready files.

4. EPA may chose to undertake analysis related to the costs, performance, and availability of applicable NO<sub>x</sub> and SO<sub>2</sub> control measures for existing and new cement kilns in the U.S. Such analysis will be issued to the contractor as a technical direction. Current LOE for this analysis should not exceed 100 hours.

In addition, when performing the analyses specified in items 1, 2, and 3 of this task, the contractor shall identify the impact of these changes to the existing regulatory support documents, including the documentation for the economic analyses (EA), the Small Business Regulatory Enforcement Fairness Act (SBREFA), and the Unfunded Mandates Reform Act (UMRA). The contractor shall summarize and present the differences between the results from these new studies and from the existing regulatory support documents to the WACOR. When the differences are significant, the WACOR will issue a written request to the contractor clarifying the sections and the contents in these documents which need to be updated to reflect the new study results.

Depending on the significance of new information, the WACOR will issue a written request for the documentation specified as above. Upon receiving a written request, the contractor shall prepare the draft update documentation and deliver it to the WACOR for review. The contractor shall expect up to two (2) revisions prior to finalization of these documents.

## **TASK 4: Upgrade the TRUM software and Analysis of Sensitivity of Control Costs for NO<sub>x</sub>, SO<sub>2</sub> and Mercury (Hg) Generated Among the Proposed Rules Developed under Multi-pollutant Reduction Technologies**

As part of the efforts in collecting control technology information to support the future NEEDS database, the contractor shall work with the WACOR through TD to provide technical support for collecting and developing algorithms for capital, fixed O&M, and variable O&M costs for existing IGCC facilities and pollution control technologies (e.g., such as wet ESP, solvent injection, SO<sub>2</sub> control and similar technologies) installed in existing fossil-fueled power generating units. Because of the slow responses from the industry, the WACOR recognizes these continuous efforts shall be handled through the full contract period. For the budget purpose, upgraded NEEDS database is only listed as a potential working area. The contractor shall be ready to work on this area when receiving the written notice from WACOR when new data becomes available.

The NEEDS database and IPM model version 4.0 and/or will reflect the updates from previous IPM and NEEDS versions regarding the model plants (e.g., basic units used in IPM models to group similar characteristics boilers in the sense of the boiler types, fuel uses, allowable emission control device selection, etc.). The TRUM model, a simplified IPM full version, uses a reduced model plants package with limited user choice variables but is capable of representing the full version IPM run with some deviation. This capability can save the Government a lot of computer time and facility requirements (e.g., CPU speed, installed memory

# **Technical Support for Clean Air Markets Division Regulatory Development Activities SOW**

Contract: EP-W-08-018, Work Assignment: 2-2

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size, and hard-disk space). Since the TRUM model is not as powerful as the full version of the IPM, it allows CAMD to do in-house quick and rough evaluations of sensitive issues in the rulemaking process without requiring time consuming full IPM version model runs. An older version of the TRUM model is based on an earlier version of the NEEDS. In order to provide the Government the same level of support, under this work assignment, the contractor shall update the TRUM model based on NEEDS database which support IPM model 4.0 or newer. This updated model should be developed in a stand-alone software manner so it can either be installed and used by CAMD staff when installed in EPA owned equipment, or be installed in a contractor designated and security-cleared machine in the contractor's office with the criteria (such as boundary condition, run years) set by CAMD experts. This option will provide the Government a choice to run this model in the most cost effective way if the Government experiences a manpower shortage during the major data crunch period.

## **TASK 5: Update IPM Parameters and Capabilities in Support of Sensitivity Study as Specified in Task 2**

When needed, the WACOR will issue a written request to the contractor to use the results from task 4 to update the IPM parameters and capabilities used in the IPM version 4.0 or newer model. Upon receiving this request, the contractor shall update requested parameters and capabilities of the Integrated Planning Model to ensure that results obtained under Task 2 are technically defensible. The WACOR will also specify in the written request the specific functional areas (e.g., installation cost, O&M cost, efficiency, applicability, and reliability) to be updated. For each functional area, the contractor shall prepare a typed issue paper of 15 pages or less which shall include the following information:

- Description of the parameters and capabilities to be updated,
- Identification of policy and technical issues to be resolved,
- Sources of data for the update.

In addition, for each issue paper, the contractor shall include not more than five extra discussion topics which will be clarified by the WACOR in the written request for these issue papers.

The WACOR and CAMD technical staff will review the issue paper, provide feedback to resolve technical and policy issues, and issue written requests authorizing programming to implement the update. The contractor shall make the programming changes and perform two sets of diagnostic model runs to test the programming changes. The contractor shall provide the WACOR with outputs from the diagnostic runs for review and comment.

For budgeting purposes, the contractor shall assume that the WACOR will request updates of seven (7) functional areas in preparation for an issue paper in each of the areas, presentation of initial and final run outputs demonstrating achievement of the updated capabilities, and documentation of the updated parameters and capabilities. The delivery schedule for the issue papers, initial and final run outputs, and documentation will be specified by the WACOR in the written request.

## **TASK 6: Allocation Analysis for Multi-pollutants under Cap and Trade Program**

Like most of the existing air pollutant emission reduction rules (e.g., Title IV, SIP Call and S-126), CAIR and CAMR rules (both final rule and rule reconsideration) also include the Cap and Trade Program elements. These rules allow States to use the federal operated Cap and Trade Program to support States in compliance with these

# Technical Support for Clean Air Markets Division Regulatory Development Activities SOW

Contract: EP-W-08-018, Work Assignment: 2-2

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rules. When implemented, the Federal Government will calculate and allocate the pollutants allowances for each of the existing power generating units based on the heat input data. The Agency will likely need analyses of allocations methods that may include NO<sub>x</sub>, SO<sub>2</sub>, Hg, or CO<sub>2</sub>.

In the rule making and litigation processes, the contractor shall provide analytical support for the evaluation of emission allowance allocation options within cap-and-trade programs designed to control harmful air emissions from large stationary sources. In addition to the IPM model, the contractor shall also use off-line analysis tools developed in the previous contract for these technical analyses to perform this task. The contractor shall analyze the impacts of allocation methods in cap and trade programs under various national emission control scenarios related to regulating multi-pollutant emissions from the electricity power generating sector. In this type of approach, a limited number of emission allowances are made available to the regulated community, which must be surrendered by each source for emissions during the compliance period. By buying or selling allowances, sources can control the degree to which they must control their emissions. A source that finds emission controls to be particularly expensive can buy allowances, in essence, arranging to have another source take over some of its control burden.

The WACOR will issue a written request to specify the boundary conditions (i.e. pollutant(s) of interest, the allocated allowances, the current emission control condition, and legally allowed emission quantities or rates) for each of the IPM strategy runs. The contractor shall provide the economic analyses that incorporate the use of the IPM strategy model runs to estimate national, state, and source-specific costs and compliance choices, generation, emissions, and prices that occur from the allocation options specified in the written request. The contractor shall also study up to five alternative modeling methods to ascertain the expected impact of the various allocation methods being modeled. The alternative modeling method will be concentrated in the following two study areas and will be driven by a written request from the WACOR:

- The options of the allocation methods consist of combinations of characteristics relating to the timing of any changes in the allocations, the basis of these changes, and the recipients of the allocations (e.g. "changing the allocation at the beginning of every calendar year and using the average of the past five year's heat input as the basis to calculate the new allocations" vs. "changing the allocation every five years and the units keeping their allocation for that five years." )
- The Contractor shall project the relative consequences of the options for the electricity market using both basic market analysis and detailed computer simulations (IPM as well as off-line analyses).

For any given combination of pollutants, geographic areas, and cap levels (the "policy case"), the contractor shall complete an analysis for the set of allocation options identified in the WACOR's written request. Upon completion of each analysis, the contractor shall deliver a technical support document that describes the policy case being considered; defines a baseline or reference case; introduces the economic analysis; lays out the options that were analyzed; discusses relevant economic issues; examines the effect of allowances on different generation sources; and presents the parsed results of IPM strategy runs to support these findings.

## IV. DELIVERABLES

The contractor shall prepare and deliver electronic files in CD-ROM format for all of the final versions of the documentation generated under this work assignment to the WACOR at the end of the completion of this work assignment.

# Technical Support for Clean Air Markets Division Regulatory Development Activities SOW

Contract: EP-W-08-018, Work Assignment: 2-2

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**TASK 1:** Work Plan.

**TASK 2:** Complete IPM model regulatory runs estimating costs, emission reductions, sensitivity of the IPM runs, feasibility of the air emission control technologies, and reliability of the power generations, in roughly 2-6 runs per month based on a schedule (to be identified by the WACOR), to support this task. Draft reports (with supporting documentation and results) of each run in electronic file format shall be delivered to the WACOR in floppy diskette or CD-ROM format within seven (7) days after receiving the WACOR's written request. Electronic versions of these final reports in floppy diskette or CD-ROM format are due to the WACOR 14 days after receiving the WACOR's comment.

**TASK 3:** Draft summary for studies in the areas of "financial analyses," "potential impacts upon employment in other economic sectors," "continuing support in the implementation of the National Energy Policy," "the response to Congressional requests," and the "analysis of impacts of carbon regulations" are due three (3) weeks after the WACOR issues the written request. The contractor shall expect more than 30% of the studies under the "response to Congressional requests" are ad-hoc in nature. When the WACOR specifies "AD-HOC" in the written request, a draft of these report(s) are due within 3 to 7 working days which the WACOR will specify in the written request. The contractor shall expect 2 revisions of these draft reports. Modified versions are due one week after the WACOR's revision comments. Final versions of these reports are due at the end of this work assignment. Final deliverables shall be submitted to the WACOR in electronic form (MS-Word 2003) and transmitted in floppy diskette or CD-ROM format.

Draft summaries for impact on EA, SBREFA, and UMRA documents are due 6 weeks after completion of the associated IPM model regulatory runs. Final documents are due 2 weeks after final comments by the WACOR. Final documents are due at the end of this work assignment. Final deliverable shall be submitted to the WACOR in electronic form (MS-Word 2003) and transmitted in floppy diskette or CD-ROM format.

Contractor shall also maintain an in-house IPM model run database as data-depot for CAMD-related IPM runs. These files should be protected inside ICF password protected ftp facility. ICF should initial and maintain monthly telephone communication with WACOR to discuss and resolve the operational problems. Depending on the security level, Contractor shall separate the CBI documentation from the regular IPM run files when authorized CAMD/PDB user can get access to general IPM run results and EPA certified person with CBI clearance can get access the CBI files. In addition, when ICF needs to remove unwanted IPM run files from database to enhance the ftp performance, EPA/CAMD related IPM run files can be removed from ICF ftp site only when ICF follows the following criteria: (1) ICF needs to inform the WACOR and get permission before proceed, (2) files shall be downloaded to two sets on either DVD or CD, one set shall transfer to WACOR and ICF shall safeguard the second set; (3) ICF shall keep the second set for at least three months to allow WACOR time to check the completeness and the integrity of these files; (4) ICF then can decide whether to continue to safeguard these files on DVD/CD (i.e., the second set) or destroy them after receiving the written instruction from WACOR; and (4) CBI files should be handled under the established CBI documentation transfer mechanism and procedures and directly deliver to CAMD CBI documentation handling person (e.g., under this work assignment, this person is the security officer - Gene-Hua Sun [sun.gene-hua@epa.gov, 202-343-9119]).

**TASK 4:** Contractor shall brief the WACOR monthly about new development in this upgrading process. An electronic copy of the upgraded model and supporting manual will be due at the end of this work assignment.

# Technical Support for Clean Air Markets Division Regulatory Development Activities SOW

Contract: EP-W-08-018, Work Assignment: 2-2

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**TASK 5:** There are no deliverables under this task item if the WACOR doesn't issue a written request to implement the results from task 2 to IPM version 3.0, 4.0, and/or newer. When issue papers have been requested, draft issue papers are due 10 days after each of the written requests are issued by the WACOR. The contractor shall expect up to four revisions for each of these issue papers. Revisions of the issue papers are due 10 days after receipt of EPA's comment. A final issue paper is due 10 days each after receiving EPA's comments of the draft report. IPM program changes are due within 15 days after receiving the WACOR's written request. Diagnostic model runs are due within 7 days after each IPM program changes. Outputs of IPM run results (standardized electronic reports in ".dat," ".rpt," and ".rpe" files, hard copy of system report, and up to three specific reports [the WACOR will specify this in each of the written requests based on EPA's needs for such IPM runs] developed in IPM version 3.0, 4.0 and/or newer updated work assignment). The contractor shall expect up to two sets of these diagnostic model runs for each of the program changes. Summary tables to compare the results for diagnostic model runs and its comparable mirror images (e.g. same boundary condition for base case or policy cases) are due five days after receiving EPA's comments among the IPM diagnostic run results.

**TASK 6:** Complete offline analysis and IPM analysis of up to nine (9) allocations (e.g., three allocation approaches per proposed rule) under this work assignment. Approximately 1-3 IPM runs per month may be required based on demand. A draft summary of technical support documents examining allocation options are due 3 weeks after the completion of the associated IPM allocation option runs. The contractor shall expect two revision requests from the WACOR. The revised white paper is due 1 week after receiving the WACOR's comments. Final documents of all kinds are due 2 weeks after final comments by the WACOR. Final documents due to the WACOR shall be submitted in electronic form (MS-Word 2003) and transmitted in floppy diskette or CD-ROM. format.

## Distribution of Deliverables

### Addressee Copies:

EPA Contracting Officer (cover only)	1
EPA Work Assignment WACOR	1

United States Environmental Protection Agency  
Washington, DC 20460

Work Assignment Number

2-2

## Work Assignment

☐ Original ☒ Amendment Number: 1Contract Number  
EP-W-08-018Contract Period  
Base

Option Period Number: 1

Title of Work Assignment  
Technical Support for Clean Air Markets  
Division Regulatory Development ActivitiesContractor  
ICF SERVICES COMPANY, L.L.C.

Specify Section and Paragraph of Contract SOW

Purpose: ☐ Work Assignment Initiation ☐ Work Assignment Close-Out  
☒ Work Assignment Amendment ☐ Incremental Funding  
☒ Work Plan Approval

Periods of Performance

From: 03/11/10

To: 03/10/11

Comments:

The purpose of this amendment is approve the work plan and cost estimate dated March 31, 2010.

☐ Superfund

## Accounting and Appropriations Data

☒ Non-Superfund

Line	DC (Max 6)	Budget/FYs (Max 4)	Appropriation Code (Max 6)	Budget Org/Code (Max 7)	Program Element (Max 9)	Object Class	Amount	(Dollars)	(Cents)	Site/Project (Max 8)	Cost Org/Code (Max 7)
1											
2											
3											
4											
5											

## Authorized Work Assignment Ceiling

Contract Period:	Cost/Fee	LOE
Previously Approved	\$0.00	9,000
This Action	\$1,229,825.00	0
Total	\$1,229,825.00	9,000

## Work Plan / Cost Estimate Approvals

Contractor WP Dated :	Cost/Fee: \$1,229,825.00	LOE: 9,000
Cumulative Approved:	Cost/Fee: \$1,229,825.00	LOE: 9,000

Work Assignment Manager Name

GENE-HUA SUN

(Signature)

(Date)

Branch/Mail Code

Phone Number

Fax Number

Project Officer Name

RYAN T. DANIELS

(Signature)

(Date)

Branch/Mail Code

Phone Number

Fax Number

Other Agency Official Name

DEBRA A. MILLER

(Signature)

(Date)

Branch/Mail Code 3803R

Phone Number 202-564-1041

Fax Number

Contracting Official Name

DEBRA A. MILLER

(Signature)

(Date)

Branch/Mail Code 3803R

Phone Number 202-564-1041

Fax Number

Contractor Acknowledgement of Receipt and Approval of Workplan (Signature and Title)

Date

# Technical Support for Clean Air Markets Division Regulatory Development Activities

Contract: EP-W-08-018, Work Assignment: 2-2, Amendment: 0001

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## Summary Information

Title: Technical Support for Clean Air Markets Division  
Regulatory Development Activities  
Period of Performance: From: 03/11/10  
To: 03/10/11  
Award Date: 03/10/10  
Total Funding:

## WA Totals

*The following item(s) have been added:*

Category	POP	Amount
Estimated Cost	Option 2	\$(b)(4)
Fixed Fee	Option 2	





United States Environmental Protection Agency  
Washington, DC 20460

## Work Assignment

Work Assignment Number

2-3

☒ Original ☐ Amendment Number:

Contract Number  
EP-W-08-018

Contract Period  
Base

Option Period Number

Title of Work Assignment  
Support for the Clean Air Act Advisory  
Committee (CAAC) and Subcommittees and  
2008 Clean Air Excellence Awards Program

Contractor  
ICF SERVICES COMPANY, L.L.C.

Specify Section and Paragraph of Contract SOW

Purpose: ☒ Work Assignment Initiation ☐ Work Assignment Close-Out  
☐ Work Assignment Amendment ☐ Incremental Funding  
☐ Work Plan Approval

Periods of Performance

From: 03/11/10

To: 03/10/11

Comments:

The contractor shall prepare a work plan and cost estimate in accordance with the  
attached Statement of Work.

☐ Superfund

### Accounting and Appropriations Data

☒ Non-Superfund

Line	DC (Max 6)	Budget/FYs (Max 4)	Appropriation Code (Max 6)	Budget Org/Code (Max 7)	Program Element (Max 9)	Object Class	Amount	(Dollars)	(Cents)	Site/Project (Max 8)	Cost Org/Code (Max 7)
1											
2											
3											
4											
5											

### Authorized Work Assignment Ceiling

Contract Period:  
Previously Approved

Cost/Fee

LOE

This Action

Total \$0.00

2,365

### Work Plan / Cost Estimate Approvals

Contractor WP Dated:

Cost/Fee:

LOE:

Cumulative Approved:

Cost/Fee: \$0.00

LOE: 2,365

Work Assignment Manager Name

JAMES P. CHILDERS

(Signature)

(Date)

Branch/Mail Code

Phone Number

Fax Number

Project Officer Name

RYAN T. DANIELS

(Signature)

(Date)

Branch/Mail Code

Phone Number

Fax Number

Other Agency Official Name

DEBRA A. MILLER

(Signature)

(Date)

Branch/Mail Code 3803R

Phone Number 202-564-1041

Fax Number

Contracting Official Name

DEBRA A. MILLER

(Signature)

(Date)

Branch/Mail Code 3803R

Phone Number 202-564-1041

Fax Number

Contractor Acknowledgement of Receipt and Approval of Workplan (Signature and Title)

Date



# Support for the Clean Air Act Advisory Committee (CAAC) and Subcommittees and 2008 Clean Air Excellence Awards Program

Contract: EP-W-08-018, Work Assignment: 2-3

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## Summary Information

Title: Support for the Clean Air Act Advisory Committee  
(CAAC) and Subcommittees and 2008 Clean Air  
Excellence Awards Program

Period of Performance: From: 03/11/10  
To: 03/10/11

Award Date:

Total Funding:

## Procurement Management Roles

### WORK ASSIGNMENT MANAGER:

U.S. E.P.A.  
Attn: JAMES P. CHILDERS  
1200 PENNSYLVANIA AVE, NW  
WASHINGTON, DC 20460

Mail Code:  
Phone Number:  
Fax Number:  
E-Mail Address: childers.pat@epa.gov

## Attachments

### Attachment Name

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Support for the Clean Air Act Advisory Committee (CAAAC) and  
Subcommittees and 2008 Clean Air Excellence Awards Program SOW

# **Support for the Clean Air Act Advisory Committee (CAAAC) and Subcommittees and 2008 Clean**

Contract: EP-W-08-018, Work Assignment: 2-3

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## **STATEMENT OF WORK**

**TITLE:** Support for the Clean Air Act Advisory Committee (CAAAC) and Subcommittees and 2008 Clean Air Excellence Awards program

**CONTRACTOR AND CONTRACT #:** ICF Consulting #EP-W-08-018

**PERIOD OF PERFORMANCE:** March 11, 2010 - March 10, 2011

**ESTIMATE LEVEL OF EFFORT:** 2365Hours

**EPA KEY PERSONNEL:** Pat Childers, Designated Federal Official (DFO) for the CAAAC and Program Manager for the Clean Air Excellence Awards program

### **WORK ASSIGNMENT MANAGER:**

Pat Childers  
1200 Pennsylvania Avenue, NW  
Washington, DC 20004  
Mail Code: 6102A  
Phone: (202) 564 -1082  
Fax: (202) 564-1352  
E-mail: [childers.pat@epa.gov](mailto:childers.pat@epa.gov)

### **PROJECT OFFICER:**

Ryan Daniels  
1200 Pennsylvania Avenue, NW  
Washington, DC 20004  
Mail Code 3803R  
Phone: (202) 564-6476  
Fax: (202) 565-2554  
E-mail: [daniels.ryan@epa.gov](mailto:daniels.ryan@epa.gov)

## **BACKGROUND**

EPA originally established the Clean Air Act Advisory Committee (CAAAC) in November 1990, and renewed the charter of the CAAAC seven times to maintain its function until November 15, 2006. The committee is authorized under the Federal Advisory Committee Act, 5 U.S.C., App. Section 9 (c). The purpose of the Committee is to provide independent advice and counsel to the Agency on policy and technical issues associated with the implementation of the Clean Air Act Amendments of 1990 (CAA). The Advisory Committee consists of some 40 members from the regulated and private industry, the academic community, state and local government and environmental organizations. The Committee is normally consulted three times a year on economic, environmental, technical, scientific and enforcement issues. The results of these meetings will be a written report providing advice to U.S. EPA on implementing the CAA.

Much of the work of the CAAAC is accomplished through its subcommittees. Currently there are four (4)

# **Support for the Clean Air Act Advisory Committee (CAAAC) and Subcommittees and 2008 Clean**

Contract: EP-W-08-018, Work Assignment: 2-3

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subcommittees: 1) Permits/NSR/Toxics; 2) Economic Incentives and Regulatory Innovation; 3) Air Quality Management; 4) Mobile Sources Technical Review Subcommittee. This statement of work will provide contractor meeting support for the full committee and its subcommittees.

## **PURPOSE AND SCOPE OF WORK**

This statement of work under this contract will provide for general conference support and other duties related to supporting the CAAAC and its four subcommittee's activities for the remainder of a twelve (12) month period from March 11, 2010 to March 10, 2011. The contractor shall prepare documents for U.S. EPA's use that present the advice and specific recommendations of the CAAAC and its appropriate subcommittees on issues related to implementing the CAA. In order to prepare these documents, the contractor shall convene up to (8) one - three day meeting of the CAAAC and its subcommittees and undertake other appropriate advisory committee support activities as described in the following tasks. The meetings will be held approximately four months apart with the exact dates and location to be determined by the Project Officer. The contractor shall provide support for this meeting as described in the tasks below.

Specific tasks to be accomplished under the proposed contract include:

## **TASKS**

Task 1: Prepare Work Plan: The Contractor shall prepare a work plan in accordance with the terms and conditions of the contract clause B.2 "Work Assignments" and Attachment 2 "Reports of Work" section entitled: "Preparation and Submission of Work Plans."

Task 2: Monthly Progress Reports. The contractor shall prepare monthly progress reports, in accordance with the terms and conditions of the contract, on a task by task basis that reports on work performed, problems encountered, if any, and work anticipated during the following month.

Task 3: Meeting planning and logistical support. The contractor shall provide planning and logistical support for the CAAAC and its subcommittees meetings. Meeting planning shall include hotel site investigation and selection, solicitation of competitive hotel bids, as necessary, arrangement of meeting space and provision of all equipment and meeting supplies. The contractor shall be responsible for coordinating all on-site logistical support during these Committee and subcommittee meetings.

Logistical support shall be provided in advance of the meetings as well as during the meetings. Such support shall include determining the most advantageous meeting room configuration, staffing registration desks, coordinating the transcription of proceedings, document distribution, coordinating audio-visual aids, and providing other support activities at the meetings as required.

Task 4: Administrative Support. The contractor shall provide administrative support as necessary to facilitate or expedite preparation for, and the conduct of, the meetings. Activities conducted under this task shall include, but are not limited to, the following:

- Preparing registration list;
- Preparing name badges and table cards;
- Handling communications with attendees in advance of meetings;

# **Support for the Clean Air Act Advisory Committee (CAAAC) and Subcommittees and 2008 Clean**

Contract: EP-W-08-018, Work Assignment: 2-3

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- Assembling and reproducing background or supplemental materials;
- Preparing and distributing meeting agendas;
- Developing and maintaining mailing lists;
- Documenting proceedings and preparing minutes in accordance with the Federal Advisory Committee Act requirements for full committee meeting only;
- Making local as well as long distance telephone calls to Advisory members for the purpose of giving and receiving administrative information in relation to the meetings;
- Utilizing commercial message service for the purpose of receiving and disseminating information. It is estimated that commercial message services will be required no more than five (5) times per meeting;
- Performing any administrative support activities such as, the reproduction and distribution of information and analyses prepared at the Committee and meetings, assisting CAAAC members in obtaining information and materials relevant to CAAAC discussions.

Task 5: Technical and Analytical Support for Presentation. The contractor shall provide technical support to the Committee meetings by conducting analyses and providing other technical support for the preparation of presentation, briefings, issues papers, and background and/or supplemental materials associated with the meetings and the topics addressed at the meetings. Graphics support, if needed, shall be included. There will be no more than three (3) topics for this meeting that would require contractor support. Project Officer technical direction is required for analytical and/or technical support.

Task 6: Prepare draft and final documents summarizing CAAAC recommendations, and technical recommendations to the EPA. Draft documents, including comprehensive minutes of all full committee meetings, shall be prepared and submitted to the Project Officer for review within three (3) weeks following the meetings. Draft documents shall be reviewed and approved by the Project Officer prior to return to contractor. Project Officer review comments will be provided two (2) weeks following receipt of draft documents. Final documents shall be submitted one (1) week following receipt of agency comments.

Task 7: Support to the Clean Air Excellence Awards Program. The contractor shall provide technical, analytical and logistical support to the Project Officer in the management of the Clean Air Excellence Awards Program, an annual OAR awards program originally recommended to EPA-OAR by the Advisory Committee. Draft and final materials, including but not limited to the following: outreach information announcing the year 2009 program, award proposal packets, scoring sheets for judging proposals, summary listing of proposals and their scoring by OAR and CAAAC reviewers, award ceremony program, summary of winners' projects, award certificates, and other appropriate documents shall be prepared in support of both the 2009 and 2010 annual awards program. The contractor will work in close coordination with the Project Officer to provide support to CAAAC members, OAR staff and senior OAR management in the successful implementation of this task item.

## **DELIVERABLES**

1. Monthly progress reports will be provided to the Project Officer.
2. Planning and logistical support under Task 2 will be provided to the agency in advance of the CAAAC and subcommittee(s) meetings. The Project Officer will notify the contractor of meeting date requirements in order that advance logistical support can be provided under the terms of the Statement of Work.
3. Administrative support under Task 3 will be provided to the agency (CAAAC and its subcommittees)

## **Support for the Clean Air Act Advisory Committee (CAAAC) and Subcommittees and 2008 Clean**

Contract: EP-W-08-018, Work Assignment: 2-3

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approximately 2 to 3 days prior to each meeting under the direction of the Project Officer. Support during the meetings will be provided in a manner that best facilitates the effective conduct of the meetings.

4. Technical and analytical support (CAAAC and its subcommittees) for use at its meetings under the direction of the Project Officer and in consultation with appropriate senior EPA managers.

5. Summary Documents - As described in Task 5, the contractor shall submit a draft summary document, including comprehensive minutes of all full committee meetings, and final summary document following each full committee meeting of the CAAAC. Draft documents are due within three weeks following the conclusion of each meeting unless otherwise notified by the Project Officer. Final documents are due within two weeks following the receipt of EPA review comments. EPA comments will be provided no later than two weeks from receipt of the draft documents.

6. Documents and other information described in Task 7 shall be prepared at the direction of the Project Officer for his review and approval. Due dates will be determined by the Project Officer, based upon an approved schedule for the implementation of the year 2010 awards program.



United States Environmental Protection Agency  
Washington, DC 20460

## Work Assignment

Work Assignment Number

2-3

☐ Original ☒ Amendment Number: 1

Contract Number  
EP-W-08-018

Contract Period  
Base

Option Period Number: 1

Title of Work Assignment  
Support for the Clean Air Act Advisory  
Committee (CAAC) and Subcommittees and  
2008 Clean Air Excellence Awards Program

Contractor  
ICF SERVICES COMPANY, L.L.C.

Specify Section and Paragraph of Contract SOW

Purpose: ☐ Work Assignment Initiation ☐ Work Assignment Close-Out  
☒ Work Assignment Amendment ☐ Incremental Funding  
☒ Work Plan Approval

Periods of Performance

From: 03/11/10

To: 03/10/11

Comments:

The purpose of this amendment is to approve the work plan and cost estimate dated March 31, 2010.

☐ Superfund

### Accounting and Appropriations Data

☒ Non-Superfund

Line	DC (Max 6)	Budget/FYs (Max 4)	Appropriation Code (Max 6)	Budget Org/Code (Max 7)	Program Element (Max 9)	Object Class	Amount	(Dollars)	(Cents)	Site/Project (Max 8)	Cost Org/Code (Max 7)
1											
2											
3											
4											
5											

### Authorized Work Assignment Ceiling

Contract Period:	Cost/Fee	LOE
Previously Approved	\$0.00	2,365
This Action	\$473,198.00	203
Total	\$473,198.00	2,568

### Work Plan / Cost Estimate Approvals

Contractor WP Dated: 03/31/10	Cost/Fee: \$473,198.00	LOE: 2,568
Cumulative Approved: 05/10/10	Cost/Fee: \$473,198.00	LOE: 2,568

Work Assignment Manager Name

JAMES P. CHILDERS

(Signature)

(Date)

Branch/Mail Code

Phone Number

Fax Number

Project Officer Name

RYAN T. DANIELS

(Signature)

(Date)

Branch/Mail Code

Phone Number

Fax Number

Other Agency Official Name

DEBRA A. MILLER

(Signature)

(Date)

Branch/Mail Code 3803R

Phone Number 202-564-1041

Fax Number

Contracting Official Name

DEBRA A. MILLER

(Signature)

(Date)

Branch/Mail Code 3803R

Phone Number 202-564-1041

Fax Number

Contractor Acknowledgement of Receipt and Approval of Workplan (Signature and Title)

Date

# Support for the Clean Air Act Advisory Committee (CAAC) and Subcommittees and 2008 Clean Air Excellence Awards Program

Contract: EP-W-08-018, Work Assignment: 2-3, Amendment: 0001

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## Summary Information

Title: Support for the Clean Air Act Advisory Committee (CAAC) and Subcommittees and 2008 Clean Air Excellence Awards Program

Period of Performance: From: 03/11/10  
To: 03/10/11

Award Date: 03/10/10

Total Funding:

## WA Totals

*The following item(s) have been added:*

Category	POP	Amount
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Estimated Cost	Option 2	\$(b)(4)
Fixed Fee	Option 2	

## WA Classification

*The following changes have occurred:*

The Labor Hour Ceiling has changed from 2365 to 2568.



United States Environmental Protection Agency  
Washington, DC 20460

## Work Assignment

Work Assignment Number  
2-4

☒ Original ☐ Amendment Number:

Contract Number  
EP-W-08-018

Contract Period  
Base

Option Period Number||

Title of Work Assignment  
Atmospheric Deposition Modeling Support  
for TMDLs and Watershed Analyses

Contractor  
CF SERVICES COMPANY, L.L.C.

Specify Section and Paragraph of Contract SOW

Purpose: ☒ Work Assignment Initiation ☐ Work Assignment Close-Out  
☐ Work Assignment Amendment ☐ Incremental Funding  
☐ Work Plan Approval

Periods of Performance

From: 03/11/10

To: 03/10/11

Comments:

The contractor shall prepare and deliver a work plan and cost estimate in accordance with the attached Statement of Work.

☐ Superfund

### Accounting and Appropriations Data

☒ Non-Superfund

Line	DC (Max 6)	Budget/FYs (Max 4)	Appropriation Code (Max 6)	Budget Org/Code (Max 7)	Program Element (Max 9)	Object Class	Amount	(Dollars)	(Cents)	Site/Project (Max 8)	Cost Org/Code (Max 7)
1											
2											
3											
4											
5											

### Authorized Work Assignment Ceiling

Contract Period:  
Previously Approved

Cost/Fee

LOE

This Action

Total \$0.00

190

### Work Plan / Cost Estimate Approvals

Contractor WP Dated :

Cost/Fee:

LOE:

Cumulative Approved:

Cost/Fee: \$0.00

LOE: 190

Work Assignment Manager Name

RUTH A. CHEMERYS

(Signature)

(Date)

Branch/Mail Code

Phone Number

Fax Number

Project Officer Name

RYAN T. DANIELS

(Signature)

(Date)

Branch/Mail Code

Phone Number

Fax Number

Other Agency Official Name

DEBRA A. MILLER

(Signature)

(Date)

Branch/Mail Code 3803R

Phone Number 202-564-1041

Fax Number

Contracting Official Name

DEBRA A. MILLER

(Signature)

(Date)

Branch/Mail Code 3803R

Phone Number 202-564-1041

Fax Number

Contractor Acknowledgement of Receipt and Approval of Workplan (Signature and Title)

Date



# Atmospheric Deposition Modeling Support for TMDLs and Watershed Analyses

Contract: EP-W-08-018, Work Assignment: 2-4

---

## Summary Information

Title: Atmospheric Deposition Modeling Support for TMDLs  
and Watershed Analyses  
Period of Performance: From: 03/11/10  
To: 03/10/11  
Award Date:  
Total Funding:

## Procurement Management Roles

### WORK ASSIGNMENT MANAGER:

U.S. E.P.A.  
Attn: RUTH A. CHEMERYS  
1200 PENNSYLVANIA AVE, NW  
WASHINGTON, DC 20460

Mail Code:  
Phone Number:  
Fax Number:  
E-Mail Address: chemerys.ruth@epa.gov

## Attachments

Attachment Name

-----  
Atmospheric Deposition Modeling Support for TMDLs and Watershed  
Analyses SOW

# **Atmospheric Deposition Modeling Support for TMDLs and Watershed Analyses SOW**

Contract: EP-W-08-018, Work Assignment: 2-4

---

## **STATEMENT OF WORK**

**Title:** Atmospheric Deposition Modeling Support for TMDLs and Watershed Analyses

**Contractor and Contract #:** ICF EP-W-08-018

**Work Assignment#:** TBD

### **Work Assignment Contracting Officer's Representative (COR):**

Ruth Chemerys  
EPA Office of Water  
Assessment and Watershed Protection Division  
1200 Pennsylvania Ave., NW  
Mailcode 4503-T  
Washington, DC 20460  
E-mail: [chemerys.ruth@epa.gov](mailto:chemerys.ruth@epa.gov)

### **Contracts Specialist:**

Ryan Daniels  
Office of Administration and Resource Management  
1200 Pennsylvania Ave., NW  
Mailcode 3803R  
Washington, DC 20460  
E-mail: [daniels.ryan@epa.gov](mailto:daniels.ryan@epa.gov)

### **Background and Purpose**

Under previous work assignments (ICF #68-W-03-028, WA 4-30, and ICF # ICF EP-W-08-018, WA 1-6), the EPA Office of Water conducted atmospheric deposition modeling for the pollutant mercury. The modeling was conducted for EPA by ICF with the purpose of providing States and EPA Regions with data needed to support Total Maximum Daily Load (TMDL) and related watershed analyses.

Over 8,800 water-bodies are listed by states as impaired by mercury, and states must develop TMDLs for impaired waters. TMDLs identify the pollutant loadings to a water-body, and determine the pollutant loads reductions needed to meet water quality standards. TMDLs account for pollutants loadings from both water point sources and non-point sources, including pollutants from atmospheric sources. In many waterbodies, atmospheric deposition is the predominant source of mercury.

The mercury deposition modeling conducted under the previous work assignment (ICF #68-W-03-028, WA 4-30) used the Regional Modeling System for Aerosols and Deposition (REMSAD) and the Community Multi-scale Air Quality (CMAQ) model. The modeling is complete, and a draft report summarizing the model results was prepared under these work assignments, including tables and graphics summarizing model results for each state. Additional model runs were also conducted under WA 0-6 using selected updated source and emissions information provided by selected states. EPA has distributed the model results and report to the States and

# **Atmospheric Deposition Modeling Support for TMDLs and Watershed Analyses SOW**

Contract: EP-W-08-018, Work Assignment: 2-4

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Regions. The purpose of this work assignment is to: 1) assist EPA in answering technical questions from States and other stakeholders about the modeling and report, and conducting limited analyses to assist in explaining the model results; and 2) conduct additional modeling and sensitivity analyses regarding REMSAD and CMAQ model results in order to determine the reasons for certain differences between REMSAD and CMAQ results.

## **Task Descriptions**

The contractor shall conduct the following tasks:

### **Task 1: Prepare Work Plan**

The Contractor shall prepare a Work Plan in accordance with the terms and conditions of the contract sections entitled "Preparation and Submission of Work Plans" and the "Work Assignment Clause."

Deliverables and schedule: Contractors' workplan within 20 calendar days of receipt of work assignment.

### **Task 2: Modeling and Sensitivity Analyses**

Previous modeling using the REMSAD and CMAQ showed some differences in mercury deposition results predicted by the models. In particular, higher dry deposition was predicted by CMAQ in certain areas of the country. As a result of investigations conducted under a previous work assignment into the primary causes of these differences, the EPA Office of Research and Development (ORD) has proposed re-configured CMAQ algorithms pertaining to vertical mixing. In addition, ORD has made changes to key atmospheric chemistry components of CMAQ. Under this task, the contractor shall conduct sensitivity analyses to determine the extent to which each change to CMAQ's code alters estimates of wet and dry deposition of mercury and explore other possible fixes to CMAQ's high dry deposition estimates. Specific analyses may include but not be limited to: 1) evaluate the mercury deposition consequences of using 14 vs. 34 layers of MM5 meteorological data; 2) determine whether the high mercury deposition patterns observed in CMAQ when using MM5 meteorological data also are present when other meteorological databases are used; and 3) use tracer techniques to determine how and where transport/diffusion occurs in CMAQ.

Deliverables and schedule: The contractor shall provide a memo to the COR summarizing the results of such analyses within 3 months of the start of the work assignment.

### **Task 3: Assist in Responding to Questions from EPA Regions and States**

Participate with the COR and other EPA technical staff on conference calls with Regions, State and other stakeholders to answer questions about modeling results. Conduct a limited number of followup analyses regarding model results based on questions from Regions, States and stakeholders. For example, stakeholders in a state have questioned whether the REMSAD results for that state may be too high, and the contractor may assist in compiling source and emissions data used in the modeling for a particular state or region. The contractor may also aggregate or breakdown the model results for a particular state by different source categories and/or geographic areas, or provide alternative graphic displays of model results for a particular state or geographic area.

# **Atmospheric Deposition Modeling Support for TMDLs and Watershed Analyses SOW**

Contract: EP-W-08-018, Work Assignment: 2-4

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Deliverables and schedule: Up to 5 conference calls as scheduled by the COR, and up to 5 analyses and/or displays of model results for selected states or geographic areas (the COR may scheduled additional calls and analyses depending on resources). Dates for the calls and analyses will be determined by the COR based on each Regions and/or States' availability and needs. Conference calls and analyses shall be completed within 9 months of start of work assignment.

United States Environmental Protection Agency  
Washington, DC 20460

Work Assignment Number

2-4

## Work Assignment

☐ Original ☒ Amendment Number: 1Contract Number  
EP-W-08-018Contract Period  
Base

Option Period Number: 1

Title of Work Assignment  
Atmospheric Deposition Modeling Support  
for TMDLs and Watershed AnalysesContractor  
CF SERVICES COMPANY, L.L.C.

Specify Section and Paragraph of Contract SOW

Purpose: ☐ Work Assignment Initiation ☐ Work Assignment Close-Out  
☒ Work Assignment Amendment ☐ Incremental Funding  
☒ Work Plan Approval

Periods of Performance

From: 03/11/10

To: 03/10/11

Comments:

The purpose of this amendment is to approve the contractor's work plan dated April 13, 2010. However, there is an initial Cost/Estimate ceiling of \$25,000 which the contractor shall not exceed without prior written approval of the Contracting Officer.

☐ Superfund

## Accounting and Appropriations Data

☒ Non-Superfund

Line	DC (Max 6)	Budget/FYs (Max 4)	Appropriation Code (Max 6)	Budget Org/Code (Max 7)	Program Element (Max 9)	Object Class	Amount	(Dollars)	(Cents)	Site/Project (Max 8)	Cost Org/Code (Max 7)
1											
2											
3											
4											
5											

## Authorized Work Assignment Ceiling

Contract Period:	Cost/Fee	LOE
Previously Approved	\$0.00	190
This Action	\$29,509.00	0
Total	\$29,509.00	190

## Work Plan / Cost Estimate Approvals

Contractor WP Dated : 04/13/10	Cost/Fee: \$29,509.00	LOE: 190
Cumulative Approved:	Cost/Fee: \$29,509.00	LOE: 190

Work Assignment Manager Name

RUTH A. CHEMERYS

(Signature)

(Date)

Branch/Mail Code

Phone Number

Fax Number

Project Officer Name

RYAN T. DANIELS

(Signature)

(Date)

Branch/Mail Code

Phone Number

Fax Number

Other Agency Official Name

DEBRA A. MILLER

(Signature)

(Date)

Branch/Mail Code 3803R

Phone Number 202-564-1041

Fax Number

Contracting Official Name

DEBRA A. MILLER

(Signature)

(Date)

Branch/Mail Code 3803R

Phone Number 202-564-1041

Fax Number

Contractor Acknowledgement of Receipt and Approval of Workplan (Signature and Title)

Date

# Atmospheric Deposition Modeling Support for TMDLs and Watershed Analyses

Contract: EP-W-08-018, Work Assignment: 2-4, Amendment: 0001

## Summary Information

Title: Atmospheric Deposition Modeling Support for TMDLs  
and Watershed Analyses  
Period of Performance: From: 03/11/10  
To: 03/10/11  
Award Date: 03/10/10  
Total Funding:

## WA Totals

*The following item(s) have been added:*

Category	POP	Amount
Estimated Cost	Option 2	(b)(4)
Fixed Fee	Option 2	



United States Environmental Protection Agency  
Washington, DC 20460

## Work Assignment

Work Assignment Number

2-4

☐ Original ☒ Amendment Number: 2

Contract Number  
EP-W-08-018

Contract Period  
Base

Option Period Number

Title of Work Assignment  
Atmospheric Deposition Modeling Support  
for TMDLs and Watershed Analyses

Contractor  
ICF SERVICES COMPANY, L.L.C.

Specify Section and Paragraph of Contract SOW

Purpose: ☐ Work Assignment Initiation ☐ Work Assignment Close-Out  
☒ Work Assignment Amendment ☐ Incremental Funding  
☐ Work Plan Approval

Periods of Performance

From: 03/11/10

To: 03/10/11

Comments:

The purpose of this amendment is to raise the work assignment Cost/Fee and level-of-effort ceiling to the full amount approved in the work plan and cost estimate.

☐ Superfund

### Accounting and Appropriations Data

☒ Non-Superfund

Line	DC (Max 6)	Budget/FYs (Max 4)	Appropriation Code (Max 6)	Budget Org/Code (Max 7)	Program Element (Max 9)	Object Class	Amount	(Dollars)	(Cents)	Site/Project (Max 8)	Cost Org/Code (Max 7)
1											
2											
3											
4											
5											

### Authorized Work Assignment Ceiling

Contract Period:	Cost/Fee	LOE
Previously Approved	\$29,509.00	190
This Action	\$0.00	0
Total	\$29,509.00	190

### Work Plan / Cost Estimate Approvals

Contractor WP Dated : 04/13/10	Cost/Fee: \$29,509.00	LOE: 190
Cumulative Approved:	Cost/Fee: \$29,509.00	LOE: 190

Work Assignment Manager Name

RUTH A. CHERMERS

(Signature)

(Date)

Branch/Mail Code

Phone Number

Fax Number

Project Officer Name

RYAN T. DANIELS

(Signature)

(Date)

Branch/Mail Code

Phone Number

Fax Number

Other Agency Official Name

DEBRA A. MILLER

(Signature)

(Date)

Branch/Mail Code 3803R

Phone Number 202-564-1041

Fax Number

Contracting Official Name

DEBRA A. MILLER

(Signature)

(Date)

Branch/Mail Code 3803R

Phone Number 202-564-1041

Fax Number

Contractor Acknowledgement of Receipt and Approval of Workplan (Signature and Title)

Date

# Atmospheric Deposition Modeling Support for TMDLs and Watershed Analyses

Contract: EP-W-08-018, Work Assignment: 2-4, Amendment: 0002

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## Summary Information

Title: Atmospheric Deposition Modeling Support for TMDLs  
and Watershed Analyses

Period of Performance: From: 03/11/10  
To: 03/10/11

Award Date: 03/10/10

Total Funding:





United States Environmental Protection Agency  
Washington, DC 20460

## Work Assignment

Work Assignment Number  
2-5

☒ Original ☐ Amendment Number:

Contract Number  
EP-W-08-018

Contract Period  
Base Option Period Number||

Title of Work Assignment  
Workshop on Improving Assessment and  
Valuation of Climate Change Impacts for  
Policy and Regulatory Analysis

Contractor  
ICF SERVICES COMPANY, L.L.C.

Specify Section and Paragraph of Contract SOW

Purpose: ☒ Work Assignment Initiation ☐ Work Assignment Close-Out  
☐ Work Assignment Amendment ☐ Incremental Funding  
☐ Work Plan Approval

Periods of Performance

From: 05/18/10

To: 12/24/10

Comments:

The contractor shall prepare a work plan and cost estimate in accordance with the attached Statement of Work.

☐ Superfund

### Accounting and Appropriations Data

☒ Non-Superfund

Line	DC (Max 6)	Budget/FYs (Max 4)	Appropriation Code (Max 6)	Budget Org/Code (Max 7)	Program Element (Max 9)	Object Class	Amount	(Dollars)	(Cents)	Site/Project (Max 8)	Cost Org/Code (Max 7)
1											
2											
3											
4											
5											

### Authorized Work Assignment Ceiling

Contract Period:  
Previously Approved

Cost/Fee

LOE

This Action

Total \$0.00 1,260

### Work Plan / Cost Estimate Approvals

Contractor WP Dated :

Cost/Fee:

LOE:

Cumulative Approved:

Cost/Fee: \$0.00

LOE: 1,260

Work Assignment Manager Name

ANDREW P. MANALE

(Signature)

(Date)

Branch/Mail Code

Phone Number

Fax Number

Project Officer Name

RYAN T. DANIELS

(Signature)

(Date)

Branch/Mail Code

Phone Number

Fax Number

Other Agency Official Name

DEBRA A. MILLER

(Signature)

(Date)

Branch/Mail Code 3803R

Phone Number 202-564-1041

Fax Number

Contracting Official Name

DEBRA A. MILLER

(Signature)

(Date)

Branch/Mail Code 3803R

Phone Number 202-564-1041

Fax Number

Contractor Acknowledgement of Receipt and Approval of Workplan (Signature and Title)

Date

# Workshop on Improving Assessment and Valuation of Climate Change Impacts for Policy and Regulatory Analysis

Contract: EP-W-08-018, Work Assignment: 2-5

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## Summary Information

Title: Workshop on Improving Assessment and Valuation of  
Climate Change Impacts for Policy and Regulatory  
Analysis  
Period of Performance: From: 05/18/10  
To: 12/24/10  
Award Date:  
Total Funding:

## Procurement Management Roles

### WORK ASSIGNMENT MANAGER:

U.S. E.P.A.  
Attn: ANDREW P. MANALE  
1200 PENNSYLVANIA AVE, NW  
WASHINGTON, DC 20460

Mail Code:  
Phone Number:  
Fax Number:  
E-Mail Address: manale.andrew@epa.gov

## Attachments

Attachment Name

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Statement of Work

# Statement of Work

Contract: EP-W-08-018, Work Assignment: 2-5

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## Statement of Work Contract Number: EP-W-08-018

### **TITLE: Workshop on Improving Assessment and Valuation of Climate Change Impacts for Policy and Regulatory Analysis**

#### **I. PERIOD OF PERFORMANCE:**

From: Date of Award

To: December 24, 2011

#### **II. ESTIMATED HOURS: 1260**

#### **III. BACKGROUND:**

The Clean Air Markets Division (CAMD) in the Office of Atmospheric Programs (OAP) within EPA's Office of Air and Radiation (OAR) requires state-of-the-art modeling and economic analysis capabilities to carry out its mission. CAMD's mission includes operating and assessing regulatory programs like the Acid Rain Program, the Clean Air Interstate Rule (CAIR), and the Clean Air Mercury Rule (CAMR) and developing new programs for controlling emissions from large stationary sources. Modeling, analyses, and assessment will be needed for policy development, rulemaking, and impact evaluations related to power generation, energy consumption, and the pollutants associated with the power sector, including sulfur dioxide (SO<sub>2</sub>), nitrogen oxides (NO<sub>x</sub>), particulate matter (PM<sub>2.5</sub>), mercury (Hg), and other toxic air pollutants as well as emissions of carbon dioxide (CO<sub>2</sub>) and other greenhouse gases.

In support of assessment for policy development, the Administration has over the past year sought to develop a transparent and defensible range of values to use in regulatory analysis for quantifying the social costs of adding (or social benefits of removing) one ton of carbon dioxide from the atmosphere. This value is referred to as the "social cost of carbon" (SCC). As a monetary measure of the incremental damage resulting from carbon emissions, the SCC is intended to include the global economic impacts of climate change, including but not limited to effects on agricultural productivity, human health, coastal property, and ecosystem services.

Most SCC estimates have been derived from one of three simulation or dynamic optimization models commonly referred to as integrated assessment models (IAMs): DICE (by William Nordhaus at Yale University), FUND (by Richard Tol at the Economic Social Research Institute in Dublin, Ireland), and PAGE (by Chris Hope at the University of Cambridge). These IAMs combine reduced-form representations of climate processes, economic growth, and feedbacks between the two in a single modeling framework. Ongoing work seeks to update these models by incorporating more of these complex interactions and improving the representation of physical and economic processes. Uncertainty in the magnitude of the physical impacts from climate change and a lack of economic damage estimates for some impacts make this overall exercise difficult.

In the summer of 2009, an interagency group developed a set of interim SCC values based on existing estimates in the literature for use in Federal regulatory analysis until a more comprehensive analysis could be conducted.

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## Statement of Work

Contract: EP-W-08-018, Work Assignment: 2-5

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Subsequently, an interagency group convened to discuss key inputs and assumptions that were then used to generate SCC estimates based on DICE, PAGE, and FUND. An extensive review of the literature was conducted to select three sets of input parameters for these models: climate sensitivity, socio-economic parameters, and the discount rate. Since each IAM takes a different approach to modeling damages, all other model features were left unchanged, relying on the model developers' best estimates.

In our effort to estimate SCC using these three IAMs we found that some components of these models could be improved by additional modeling refinements and empirical research. Chief among these are the damage functions, which do not include some potentially important impact categories. For example, ocean acidification from CO<sub>2</sub> emissions is a source of potentially large damages that is not quantified explicitly in any of the three models. Tol (2009) has highlighted others: "...the big unknowns include: extreme climate scenarios, the very long term, biodiversity loss, the possible effects of climate change on economic development and even political violence." The interagency group adjourned noting a need to thoroughly review the damage functions—in particular, how they incorporate adaptation, technological change, and catastrophic damages—and to document more thoroughly omitted impacts. Often gaps in the economic and integrated assessment literature make changes to these aspects of the models challenging. At the same time, the science of climate change (including research on socio-economic impacts) is moving rapidly. The Federal government is committed to exploring how modeling frameworks can be improved so the latest research on impacts and damages are better represented in policy and regulatory analyses, and has set a preliminary goal of revisiting the SCC values within two years.

As part of its technical support for technical support for clean air markets and related environmental programs, the contractor is asked to provide meeting development and facilitation. This activity includes securing facilities, preparing, agendas, taking notes, developing presentations and supplying, setting up, and running audio/video equipment, demonstrating software applications, conducting registration, copying and distributing handouts, and preparing the presentation materials and answers to questions asked during the events, and making such materials ready for posting on EPA websites.

#### IV. PURPOSE AND OBJECTIVE:

The purpose of this work assignment is to obtain contractor support to organize a workshop where experts will discuss the assessment of climate change damages for policy and regulatory analysis, with a particular focus on climate change integrated assessment modeling and related research. One goal of the workshop will be to catalyze peer-reviewed literature and improvements in modeling capabilities that can directly inform near-term analyses, including the next round of interagency SCC discussions. A second goal will be to identify and prioritize longer-term research that will advance the USG's ability to incorporate information about climate change impacts into policy and regulatory analyses.

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The workshop will include:

- 1) a review of existing IAMs and discussion of conceptual issues involved in improving the estimation of climate damages for policy analysis, and
- 2) a constructive audit of existing empirical research on climate change impacts and damages aimed at refining the current representation of these effects in IAMs and motivating new research to fill critical gaps.

Part I will begin with an introduction to the workshop, including a recap of the previous inter-agency SCC process, and an overview of existing IAMs. This will be followed by a detailed exploration of several critical

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## Statement of Work

Contract: EP-W-08-018, Work Assignment: 2-5

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modeling issues that emerged during the inter-agency process. These include challenges such as: extrapolating impacts to high temperatures, assessing risks of catastrophic climate changes, projecting adaptive capacity, accounting for impacts of climate change on economic growth, incorporating more sectoral interactions, coupling economic models with more detailed earth system models and more. Next there will be a presentation of a generalized, transparent, and flexible climate change damage assessment framework that can be easily updated as new research is completed and rapidly deployed as new policies are proposed. Part I will conclude with a broader discussion of approaches for incorporating climate damage assessments into policy analysis. This part of the workshop will help identify recommendations for future model developments needed to improve estimation of the economic benefits of GHG reducing policies in both the short and long term. In the short term (i.e., within the next 2 yrs), these discussions will help identify the aspects of existing models that could be incorporated within a more general modeling framework in order to improve the climate damage assessments for the next round of interagency SCC discussions (including the development of marginal benefit estimates for non-CO2 GHG emission reductions). The recommendations of the workshop participants also will help identify and prioritize longer term research needs that, in part, focus on how to incorporate additional realism/complexity into climate policy analysis.

Part II will aim to document and synthesize the latest research on climate change impacts and the associated economic damages in order to identify key knowledge gaps and motivate additional peer-reviewed research that can directly contribute to improving integrated assessment modeling. In the short term, this will help to identify existing research which could be utilized in the calibration of damage functions for the next USG SCC analysis (expected to begin in early 2012). These discussions will aid EPA in prioritizing near term research needs on particular impact and damage categories. In addition to catalyzing additional peer-reviewed work that can be incorporated into future IAMs, the workshop will explore the development of an open-architecture database that will help to organize and synthesize the findings from climate change impact and damage studies as they accumulate over time.

Parts I and II of the workshop could be separated in time by a few months but should be planned somewhat concurrently. The workshop should be held in Fall-Winter of 2010, ideally with Part I taking place in October, and Part II in early December. Participants should come from federal agencies, academia, and NGOs. A smaller, invitation only audience may provide more technical, focused discussion. Some participants may be invited to only one part of the workshop.

The contractor shall:

1. secure a location for the workshop, invite participants, and handle all technical logistics of conducting the workshop,
2. make all slide presentations and Q&A available on line as a proceedings document,
3. summarize the workshop and recommendations from Parts I and II in a report to EPA,
4. help to organize the publication of select papers from Parts I and II (e.g., in a special issue of *Climatic Change* or other interdisciplinary journal), and
5. make recommendations on a framework for an open-architecture impacts database that can be easily accessed and managed by relevant academic researchers and government analysts to track the latest research on climate impacts and associated economic damages going forward.

The qualified contractor shall have extensive expertise in working on climate change issues, including in-house technical experts focused on climate change impacts and adaptation strategies; have extensive experience in organizing and hosting technical workshops for government and academic audiences; and be skilled at integrating and managing multidisciplinary teams.

## Statement of Work

Contract: EP-W-08-018, Work Assignment: 2-5

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### III. QUALITY ASSURANCE (QA) REQUIREMENTS

The contractor shall submit with their technical proposal a written Quality Assurance Project Plan for any project that is developing environmental measurements or a Quality Assurance Supplement to the Quality Management Plan for any project which generates environmental data using models.

### IV. TASKS AND DELIVERABLES:

The WAM will review all deliverables in draft form and provide revisions and/or comments to the contractor. The contractor shall prepare the final deliverables incorporating the WAM's comments. Contractor shall provide the WAM with both electronic and hard copy versions of all deliverables.

Contractor personnel shall at all times identify themselves as Contractor employees and shall not present themselves as EPA employees. Furthermore, they shall not represent the views of the U.S. Government, EPA, or its employees. In addition, the Contractor shall not engage in inherently governmental activities, including but not limited to actual determination of EPA policy and preparation of documents on EPA letterhead.

**Task 1: Prepare Workplan** (Contract Reference EP-W-08-018: Technical support, Communications, Outreach, Design, Graphics, and Meeting Facilitation Page 9-12)

The contractor, in accordance with the terms of the contract, shall prepare a work plan and cost estimate upon issuance of a work assignment. The work plan shall outline and describe the approach that will be taken for finding a venue/workshop location and arranging audiovisual needs and support, hotel lodging, inviting and contacting speakers and attendees, logistics for both attendees and invited speakers. The plan shall also include the timeline and due dates for deliverables, as well as a detailed cost estimate by task and a staffing plan. The plan will serve as the roadmap for implementation of the workshop.

The WAM and the CO will review the work plan. However, only the CO can approve/disapprove the work plan. The contractor shall prepare a revised work plan incorporating the Contracting Officer's comments, if required. Included in this task are the administrative functions needed for this work assignment.

#### Deliverables and Schedule for Task 1:

- 1a. Submit the work plan to the WAM in accordance with the contract.
- 1b. Submit revised workplan to the Contracting Officer, if required.
- 1c. Within one week following Work Plan approval of this Work Assignment, a kick-off meeting or teleconference shall be held between the Contractor and WAM to discuss the technical elements of the project.
- 1d. Within 4 weeks of Work Plan approval, the contractor shall set up a password protected website to help keep track of workshop logistics. This website shall later be migrated to the EPA website and be accessible to workshop participants and attendees for workshop information, papers, and presentations.

**Task 2: Select date and secure workshop location** (Contract Reference: Communications, Outreach, Design, Graphics, and Meeting Facilitation Page 11)

After the EPA provides the contractor with general criteria for location of the workshop and the space, the contractor shall make the necessary arrangements to acquire the space for the period of the workshop. The workshop date(s) shall accommodate the agenda (i.e., 1-2 days for Part I and 1-2 days for Part II, as needed) and

## Statement of Work

Contract: EP-W-08-018, Work Assignment: 2-5

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the location shall be in an easily accessible location for travel purposes (e.g., DC metro area). The location shall accommodate approximately 100 attendees.

### Deliverables and Schedule for Task 2:

**2a.** Submit a list of candidate locations and dates to WAM as soon as possible, but no later than 4 weeks following the completion of Task 1c.

**2b.** Submit confirmation that location is secured within 1 week of receiving comments about candidate locations from WAM.

### **Task 3: Develop Workshop Agenda** (Contract Reference: Communications, Outreach, Design, Graphics, and Meeting Facilitation page 11 #23)

The contractor, in consultation with the WAM, shall develop the agenda for the workshop that will allow for approximately 30 speakers and time for discussion, along the lines of the following:

#### Part I. Modeling Climate Change Impacts and Associated Economic Damages

##### Day 1

#### ***Introduction to the Workshop*** [1-2 speakers, ~45 minutes]

Welcome, Purpose and Overview of Part I and II

Technical background and review of SCC process (will include discussion of limitations highlighted in SCC writeup (e.g., lack of values for non-CO2 GHGs))

Broader Policy Context and Questions: Brief overview of approaches for incorporating climate impacts assessment and estimates of associated economic damages into policy analysis.

#### ***Session 1: Overview of Existing Integrated Assessment Models*** [6 speakers + Q&A, ~2.5-3 hours]

The Session moderator will start by providing a very brief overview of IAMs and the common components in them. He/she will also describe the charge questions that each modeler was asked to address in his presentation. This will help develop a common format so the audience can transition between the three models more easily. (The charge questions should be partly based on the themes that follow in Section 3, so that the modelers elaborate on how their models deal with those items.)

- a. Models used for development of current USG SCC values
  - i. DICE (Nordhaus)
  - ii. PAGE (Hope)
  - iii. FUND (Tol/Anthoff)
- b. More complex characterization of climate impacts based on other Integrated Assessment Models
  - i. Overview of other Integrated Assessment Models
  - ii. GCAM (JGCRI – UMD/PNNL) and development of iESM (PNNL/LBNL/ORNL)
  - iii. IGSM (MIT)

#### ***Lunch [1 hour]***

## Statement of Work

Contract: EP-W-08-018, Work Assignment: 2-5

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### ***Session 2: Near Term DOE and EPA Efforts*** [2 speakers, 1 discussant, Q&A ~1.5 hours]

- a. Proposed Impacts Knowledge Platform (DOE)
  - Overview of a proposed open-architecture impacts database that can be easily accessed and managed by relevant academic researchers and government analysts, help identify knowledge gaps and provide a framework for future damages research, and be incorporated into integrated assessment research, and
- b. Proposed Generalized Modeling Framework (EPA)
  - Overview of a proposed generalized modeling framework for valuing climate change impacts. The framework would combine the key elements of existing IAMs into a unified model, and would promote a standardized set of accounting conventions for the representation of various pathways through which climate changes may affect economic productivity and human well-being. The model would be transparent, fully documented, and freely available to the public.

### ***Session 3: Critical Modeling Issues in Assessment and Valuation of Climate Change Impacts*** [5-10 speakers + discussion, ~5.5 hours, with part spilling onto day 2]

- a. Sectoral and regional disaggregation and interactions
- b. Incorporation of natural and socio-economic uncertainty
- c. Extrapolation of damage estimates to high temperatures, including Earth system tipping points and potential associated economic catastrophes
- d. Nonmarket Impacts (incl. discussion of multiplicative vs. additive damages, and multivariate utility functions)
- e. Adaptation and technological change
- f. Methods for extrapolating exogenous variables to model time horizon

## Day 2

### ***Welcome*** [10-15 minutes]

Recap of Day 1, Overview of Day 2

### ***Session 3 (continued)*** [Number of speakers and time TBD after finalizing Day 1 schedule]

### ***Session 4: Approaches for Incorporating Climate Impact Assessments into Policy Analysis*** [3 speakers + discussion, ~1.5-2 hours]

- a. Benefit-cost analysis (based on “potential compensation test”)
  - i. Using the SCC for marginal policies
  - ii. Direct calculation of NPV for non-marginal policies
  - iii. Accounting for risk aversion
- b. Social welfare analysis (based on explicit “social welfare function”)
  - i. equity weights
  - ii. discounting based in part on intergenerational equity considerations
- c. Other approaches:
  - i. Cost-effectiveness analysis
  - ii. Risk management decision frameworks



## Statement of Work

Contract: EP-W-08-018, Work Assignment: 2-5

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*[Note: The organization of Session 4 is still provisional, but we want to make sure the distinction between BCA based on potential compensation and social welfare analysis is prominent.]*

### Part II. Research on Climate Change Impacts and Associated Economic Damages [~2 days]

#### **Introduction** [1-2 speakers, 15-30 minutes]

Recap of Part I, Purpose and outline of Part II  
Recap of proposed Impacts Database/Knowledge Platform

#### **Sessions covering research on various impact categories** [~9-18 speakers + discussion]

- A. Agriculture
- B. Human Health
- C. Water Availability
- D. Ecosystems and Ecosystem Services (including biodiversity loss)
- E. Coastal Zone
- F. Ocean Acidification
  - i. Overview of chemistry and how it should inform SCC
  - ii. Modeling impacts to coral reefs and associated damages (ORD ESRP)
  - iii. Modeling impacts to fisheries and associated damages (NOAA)
- G. Energy Production and Consumption
- H. Socio-economic and geopolitical impacts, including migration and national security
- I. Others

*[Notes: The provisional list above is roughly the categorization used in NRC (2010).<sup>1</sup> This structure could accommodate two presenters per category if desired – one with expertise in the relevant physical science impacts and the other with expertise in the economics research linking climate impacts to economic damages.*

*Catastrophic impacts are covered in Part I instead of Part II because it is difficult to discuss how they should be represented in a bottom-up model without discussing what the catastrophic events are. However, another catastrophic presentation may be appropriate in Part II to discuss the latest science on catastrophic impacts and the probability of their occurrence, or we can ask each presenter to address how “catastrophic” events might impact their particular sector.]*

#### Deliverables and Schedule for Task 3:

- 3a.** Submit a draft agenda for the workshop within 2 weeks of completion of Task 1 c.
- 3b.** Submit a revised agenda within 2 weeks of receiving comments from the WAM on 3a.
- 3c.** Submit final agenda within 1 week of securing commitments from all speakers.

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<sup>1</sup> National Research Council. 2010. Hidden Costs of Energy: Unpriced Consequences of Energy Production and Use. Washington, D.C.: National Academies Press.  
[http://www.nap.edu/catalog.php?record\\_id=12794](http://www.nap.edu/catalog.php?record_id=12794) .

## Statement of Work

Contract: EP-W-08-018, Work Assignment: 2-5

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### **Task 4: Identify speakers, moderators, and attendees and invite all participants** (Contract Reference: Page 11, #23 logistical support)

The contractor shall identify speakers and attendees, with a goal of approximately 30 total participants at the workshop (including presenters, discussants and moderators) and 100 total attendees. The speakers shall include researchers with extensive expertise in the topics covered in their session. Qualified speakers should have backgrounds in economics and/or natural sciences relevant to integrated assessment modeling and climate impacts assessment and be recognized experts in their field. The contractor shall provide each participant with the goals of the workshop and/or charge questions developed in a later task. The contractor shall clearly explain verbally and in writing the roles for each participant. Speakers shall be compensated for their travel expenses and receive an honorarium for their services.

The contractor shall identify a moderator for each session with expertise in the research topics covered in their session. The moderator shall not only ensure that the schedule is adhered to, but also shall be able to stimulate the discussion if needed. The moderators shall not receive compensation for their participation, and may come primarily from EPA, DOE, or other Federal agencies.

Attendance at the workshop will be by invitation only. Attendees should come from federal agencies, academia, and NGOs and have technical expertise in economics and/or natural sciences related to climate impacts.

#### Deliverables and Schedule for Task 4:

- 4a. Submit candidate list of speakers and moderators within 2 weeks of completion of Task 1c.
- 4b. Submit final list of speakers and moderators within 4 weeks of receiving comments from WAM on 4a.
- 4c. Extend invitations to speakers within 1 week of completing 4b.
- 4d. Submit candidate list of attendees within 2 weeks of completing 4b.
- 4e. Submit final list of invited attendees within 2 weeks of receiving comments from WAM on 4d.
- 4f. Submit final list of committed speakers at least 3 months before Part I of the workshop.
- 4g. Send invitations to attendees 2-3 months before Part I of the workshop.

### **Task 5: Conduct Workshop** (Contract Reference: Page 11, #23)

The contractor shall host and provide logistical support during the workshop on the scheduled date(s). Researchers shall make their presentations, discussants (if applicable) will present their comments, and time shall be allocated for questions and discussion. The contractor shall identify a moderator for each session and the moderator shall be familiar with the research topic for their session. The moderator shall not only ensure that the schedule is adhered to, but also shall be able to stimulate the discussion if needed. The contractor shall arrange for all necessary audio-visual equipment (e.g., LCD projector, laptop computer, flip charts) and other necessary materials (e.g., handouts). The contractor shall handle all logistics associated with the facility (e.g., security, room temperature, appropriate noise levels). The contractor shall also arrange for necessary transcription of workshop discussions in order to write the summary report.

#### Deliverables and Schedule for Task 5:

- 5a. Confirm logistical details with WAM 2 weeks prior to the workshop start date.
- 5b. Host workshop on scheduled date(s).

### **Task 6: Write Summary Report** (Contract Reference: Page 12 #23)

## Statement of Work

Contract: EP-W-08-018, Work Assignment: 2-5

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The contractor shall prepare a summary report of the workshop. The report shall include summaries of the presentations on the agenda and discussions throughout the workshop, including any question and answer sessions. The report shall try to synthesize any recommendations made by the workshop participants highlighting future research needs and next steps.

### Deliverables and Schedule for Task 6:

- 6a. Facilitate a meeting among the workshop organizers within 1 week following Part I of the workshop to gather feedback on general impressions, lessons, and key recommendations gleaned from the workshop presentations and discussions. The discussion from this meeting shall aid the contractor in drafting the summary report.
- 6b. Post links to all slide presentations and papers from Part I on the website within 2 weeks of the end of Part I of the workshop. Make the website accessible to all participants of both Part I and Part II.
- 6c. Facilitate a meeting among the workshop organizers within 1 week following Part II of the workshop to gather feedback on general impressions, lessons, and key recommendations gleaned from the workshop presentations and discussions. The discussion from this meeting shall aid the contractor in drafting the summary report.
- 6d. Post links to all slide presentations and papers from Part II on the website within 2 weeks of the end of Part II of the workshop. Make the website accessible to all participants of both Part I and Part II.
- 6e. Submit draft summary report within 5 weeks of completing 6c.
- 6f. Submit final summary report within 3 weeks of receiving comments from the WAM on 6e.

### **Task 7:** (Contract Reference: Page 11 #23)

The contractor shall help to organize the publication of select papers from Parts I and II (e.g., in a special issue of *Climatic Change* or other interdisciplinary journal).

### Deliverables and Schedule for Task 7:

- 7a. Submit list of candidate outlets/journals, including information on the pros and cons of each, within 3 weeks of completing 4b.
- 7b. Secure a commitment from the selected journal after receiving comments on 7a from the WAM.
- 7c. Gather final papers from workshop participants, format them according to the journal guidelines, and submit them to the journal for review.

### **Task 8:** (Contract Reference: Technical support activities Pages 9-12)

The contractor shall make recommendations on a framework for an open-architecture impacts database that can be easily accessed and managed by relevant academic researchers and government analysts to track the latest research on climate impacts and associated economic damages going forward.

### Deliverables and Schedule for Task 8:

- 8a. Submit draft memo outlining options for the creation of an open-architecture impacts database within 16 weeks of completion of Task 1c.

## Statement of Work

Contract: EP-W-08-018, Work Assignment: 2-5

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**8b.** Submit final memo explaining steps involved in creating the database within 3 weeks of receiving comments on 8a from the WAM.

### **X. SCHEDULE FOR DELIVERABLES:**

The contractor shall provide the following specific deliverables to the EPA WAM:

	DELIVERABLE	FORM AND QUANTITY	SCHEDULE
Task 1:	1a. Work Plan	Electronic	In accordance with terms of the contract
	1b. Revised Work Plan, if required.	Electronic	In accordance with terms of the contract
	1c. Kick-off Meeting	Conference call/meeting	Within one week of Work Plan approval
	1d. Set up website.	Electronic	Within 4 weeks of Work Plan approval
Task 2:	2a. List of Candidate Locations and Dates	Electronic	Within 4 weeks following the completion of 1c.
	2b. Confirmation of Location and Dates	Electronic	Within 1 week of receiving comments from WAM on 2a.
Task 3:	3a. Draft Agenda	Electronic	Within 2 weeks of completion of 1c
	3b. Revised Agenda	Electronic	Within 2 weeks of receiving comments from the WAM on 3a
	3c. Final Agenda	Electronic	Within 1 week of securing commitments from all speakers
Task 4	4a. Candidate list of speakers and moderators	Electronic	Within 2 weeks of completion of 1c.
	4b. Final list of speakers and moderators	Electronic	Within 4 weeks of receiving comments from WAM on 4a
	4c. Invite speakers	Telephone and Formal Letter sent via email	Within 1 week of receiving comments from WAM on 4b
	4d. Candidate list of attendees	Electronic	Within 2 weeks of completing 4b
	4e. Final list of attendees	Electronic	Within 2 weeks of receiving comments from WAM on 4d.
	4f. Final list of committed speakers	Electronic	At least 3 months before Part I of the workshop.
	4g. Invite Attendees	Formal letter sent via email	2-3 months before Part

## Statement of Work

Contract: EP-W-08-018, Work Assignment: 2-5

			I of the workshop
Task 5:	5a. Confirmation of logistical details	Electronic and Conference Call	2 weeks prior to the workshop start date
	5b. Host Workshop	In person	On scheduled date(s)
Task 6:	6a. Facilitate post-workshop meeting 1.	In person or via conference call	Within 1 week following Part I
	6b. Post Part I workshop presentation materials on website	Electronic	Within 2 weeks of the end of Part I of the workshop.
	6c. Facilitate post-workshop meeting 2.	In person or via conference call	Within 1 week following Part II
	6d. Post Part II workshop presentation materials on website	Electronic	Within 2 weeks of the end of Part II of the workshop.
	6e. Draft Summary Report	Electronic	Within 5 weeks of completing 6c
	6f. Final Summary Report	Electronic	Within 3 weeks of receiving comments from the WAM on 6e.
Task 7:	7a. Candidate List of Journals/Publication Outlets	Electronic	Within 3 weeks of competing 4b.
	7b. Commitment from selected journal	Electronic	As soon as possible after receiving comments from the WAM on 7a.
	7c. Submit final papers to selected journal	Electronic	As soon as possible after completion of the workshop and according to timeline agreed to with journal
Task 8:	8a. Draft memo on database options	Electronic	Within 16 weeks of completion of Task 1c
	8b. Final memo on database process	Electronic	Within 3 weeks of receiving comments from the WAM on 8a.

United States Environmental Protection Agency  
Washington, DC 20460

## Work Assignment

Work Assignment Number

2-5

☐ Original ☒ Amendment Number: 1

Title of Work Assignment

Workshop on Improving Assessment and  
Valuation of Climate Change Impacts for  
Policy and Regulatory Analysis

Contract Number

EP-W-08-018

Contract Period

Base

Option Period Number: 1

Contractor

ICF SERVICES COMPANY, L.L.C.

Specify Section and Paragraph of Contract SOW

Purpose:

☐ Work Assignment Initiation☐ Work Assignment Close-Out☒ Work Assignment Amendment☐ Incremental Funding☐ Work Plan Approval

Periods of Performance

From: 05/19/10

To: 12/24/10

Comments:

The purpose of this amendment is to add Chris Dockins as Alternate Work Assignment  
Manager.☐ Superfund

## Accounting and Appropriations Data

☒ Non-Superfund

Line	DC (Max 6)	Budget/FYs (Max 4)	Appropriation Code (Max 6)	Budget Org/Code (Max 7)	Program Element (Max 9)	Object Class	Amount	(Dollars)	(Cents)	\$/M/Project (Max 8)	Cost Org/Code (Max 7)
1											
2											
3											
4											
5											

## Authorized Work Assignment Ceiling

Contract Period:

Cost/Fee

LOE

Previously Approved

\$0.00

1,260

This Action

\$0.00

0

Total

\$0.00

1,260

## Work Plan / Cost Estimate Approvals

Contractor WP Dated :

Cost/Fee:

LOE: 1,260

Cumulative Approved:

Cost/Fee: \$0.00

LOE: 1,260

Work Assignment Manager Name

ANDREW P. MANALE

Branch/Mail Code

Phone Number

Fax Number

(Signature)

(Date)

Project Officer Name

RYAN T. DANIELS

Branch/Mail Code

Phone Number

Fax Number

(Signature)

(Date)

Other Agency Official Name

DEBRA A. MILLER

Branch/Mail Code 3803R

Phone Number 202-564-1041

Fax Number

(Signature)

(Date)

Contracting Official Name

DEBRA A. MILLER

Branch/Mail Code 3803R

Phone Number 202-564-1041

Fax Number

(Signature)

(Date)

Contractor Acknowledgement of Receipt and Approval of Workplan (Signature and Title)

Date

# Workshop on Improving Assessment and Valuation of Climate Change Impacts for Policy and Regulatory Analysis

Contract: EP-W-08-018, Work Assignment: 2-5, Amendment: 0001

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## Summary Information

Title: Workshop on Improving Assessment and Valuation of  
Climate Change Impacts for Policy and Regulatory  
Analysis  
Period of Performance: From: 05/19/10  
To: 12/24/10  
Award Date: 05/19/10  
Total Funding:

## Procurement Management Roles

*The following item(s) have been added:*

ALTERNATE WORK ASSIGNMENT MANAGER:

U.S. E.P.A.  
Attn: PAUL C. DOCKINS  
1200 PENNSYLVANIA AVE, NW  
WASHINGTON, DC 20460

Mail Code:  
Phone Number:  
Fax Number:  
E-Mail Address: dockins.chris@epa.gov

United States Environmental Protection Agency  
Washington, DC 20460**Work Assignment**

Work Assignment Number

2-5

☐ Original ☒ Amendment Number: 2

Title of Work Assignment

Workshop on Improving Assessment and  
Valuation of Climate Change Impacts for  
Policy and Regulatory AnalysisContract Number  
EP-W-08-018Contract Period  
Base

Option Period Number||

Contractor

ICF SERVICES COMPANY, L.L.C.

Specify Section and Paragraph of Contract SOW

Purpose: ☐ Work Assignment Initiation ☐ Work Assignment Close-Out  
☒ Work Assignment Amendment ☐ Incremental Funding  
☐ Work Plan Approval

Periods of Performance

From: 05/19/10

To: 03/10/11

Comments:

The purpose of this amendment is to request a revised work plan and cost estimate in  
accordance with the revised Statement of Work.☐ Superfund**Accounting and Appropriations Data**☒ Non-Superfund

Line	DC (Max 6)	Budget/FYs (Max 4)	Appropriation Code (Max 6)	Budget Org/Code (Max 7)	Program Element (Max 9)	Object Class	Amount	(Dollars)	(Cents)	Site/Project (Max 8)	Cost Org/Code (Max 7)
1											
2											
3											
4											
5											

**Authorized Work Assignment Ceiling**

Contract Period:	Cost/Fee	LOE
Previously Approved	\$0.00	1,260
This Action	\$0.00	340
Total	\$0.00	1,600

**Work Plan / Cost Estimate Approvals**

Contractor WP Dated :	Cost/Fee:	LOE: 1,600
Cumulative Approved:	Cost/Fee: \$0.00	LOE: 1,600

Work Assignment Manager Name

ANDREW P. MANALE

Branch/Mail Code

Phone Number

Fax Number

(Signature)

(Date)

Project Officer Name

RYAN T. DANIELS

Branch/Mail Code

Phone Number

Fax Number

(Signature)

(Date)

Other Agency Official Name

DEBRA A. MILLER

Branch/Mail Code 3803R

Phone Number 202-564-1041

Fax Number

(Signature)

(Date)

Contracting Official Name

DEBRA A. MILLER

Branch/Mail Code 3803R

Phone Number 202-564-1041

Fax Number

(Signature)

(Date)

Contractor Acknowledgement of Receipt and Approval of Workplan (Signature and Title)

Date



# Workshop on Improving Assessment and Valuation of Climate Change Impacts for Policy and Regulatory Analysis

Contract: EP-W-08-018, Work Assignment: 2-5, Amendment: 0002

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## Summary Information

Title: Workshop on Improving Assessment and Valuation of Climate Change Impacts for Policy and Regulatory Analysis

Period of Performance: From: 05/19/10 To: 03/10/11

Award Date: 05/19/10

Total Funding:

## Attachments

*The following item(s) have been added:*

Attachment Name

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Revised Statement of Work

## WA Classification

*The following changes have occurred:*

The Labor Hour Ceiling has changed from 1260 to 1600.

The Anticipated Expiration Date has changed from 12/24/10 to 03/10/11.

## Statement of Work

Contract Number: EP-W-08-018

**TITLE: Workshop on Improving Assessment and Valuation of Climate Change Impacts for Policy and Regulatory Analysis****Contract #:** EP-W-08-018**Level of Effort:** 1600 hours**I. BACKGROUND:**

The Clean Air Markets Division (CAMD) in the Office of Atmospheric Programs (OAP) within EPA's Office of Air and Radiation (OAR) requires state-of-the-art modeling and economic analysis capabilities to carry out its mission. CAMD's mission includes operating and assessing regulatory programs like the Acid Rain Program, the Clean Air Interstate Rule (CAIR), and the Clean Air Mercury Rule (CAMR) and developing new programs for controlling emissions from large stationary sources. Modeling, analyses, and assessment will be needed for policy development, rulemaking, and impact evaluations related to power generation, energy consumption, and the pollutants associated with the power sector, including sulfur dioxide (SO<sub>2</sub>), nitrogen oxides (NO<sub>x</sub>), particulate matter (PM<sub>2.5</sub>), mercury (Hg), and other toxic air pollutants as well as emissions of carbon dioxide (CO<sub>2</sub>) and other greenhouse gases.

In support of assessment for policy development, the Administration has over the past year sought to develop a transparent and defensible range of values to use in regulatory analysis for quantifying the social costs of adding (or social benefits of removing) one ton of carbon dioxide from the atmosphere. This value is referred to as the "social cost of carbon" (SCC). As a monetary measure of the incremental damage resulting from carbon emissions, the SCC is intended to include the global economic impacts of climate change, including but not limited to effects on agricultural productivity, human health, coastal property, and ecosystem services.

Most SCC estimates have been derived from one of three simulation or dynamic optimization models commonly referred to as integrated assessment models (IAMs): DICE (by William Nordhaus at Yale University), FUND (by Richard Tol at the Economic Social Research Institute in Dublin, Ireland), and PAGE (by Chris Hope at the University of Cambridge). These IAMs combine reduced-form representations of climate processes, economic growth, and feedbacks between the two in a single modeling framework. Ongoing work seeks to update these models by incorporating more of these complex interactions and improving the representation of physical and economic processes. Uncertainty in the magnitude of the physical impacts from climate change and a lack of economic damage estimates for some impacts make this overall exercise difficult.

In the summer of 2009, an interagency group developed a set of interim SCC values based on existing estimates in the literature for use in Federal regulatory analysis until a more comprehensive analysis could be conducted. Subsequently, an interagency group convened to discuss key inputs and assumptions that were then used to generate SCC estimates based on DICE, PAGE, and FUND. An extensive review of the literature was conducted to select three sets of input parameters for these models: climate sensitivity, socio-economic

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parameters, and the discount rate. Since each IAM takes a different approach to modeling damages, all other model features were left unchanged, relying on the model developers' best estimates.

In our effort to estimate SCC using these three IAMs we found that some components of these models could be improved by additional modeling refinements and empirical research. Chief among these are the damage functions, which do not include some potentially important impact categories. For example, ocean acidification from CO<sub>2</sub> emissions is a source of potentially large damages that is not quantified explicitly in any of the three models. Tol (2009) has highlighted others: "...the big unknowns include: extreme climate scenarios, the very long term, biodiversity loss, the possible effects of climate change on economic development and even political violence." The interagency group adjourned noting a need to thoroughly review the damage functions—in particular, how they incorporate adaptation, technological change, and catastrophic damages—and to document more thoroughly omitted impacts. Often gaps in the economic and integrated assessment literature make changes to these aspects of the models challenging. At the same time, the science of climate change (including research on socio-economic impacts) is moving rapidly. The Federal government is committed to exploring how modeling frameworks can be improved so the latest research on impacts and damages are better represented in policy and regulatory analyses, and has set a preliminary goal of revisiting the SCC values within two years.

As part of its technical support for clean air markets and related environmental programs, the contractor is asked to provide meeting development and facilitation. This activity includes securing facilities, preparing, agendas, taking notes, developing presentations and supplying, setting up, and running audio/video equipment, demonstrating software applications, conducting registration, copying and distributing handouts, and preparing the presentation materials and answers to questions asked during the events, and making such materials ready for posting on EPA websites.

## **II. PURPOSE AND OBJECTIVE:**

The purpose of this work assignment is to obtain contractor support to organize two workshops where experts will discuss the assessment of climate change damages for policy and regulatory analysis, with a particular focus on climate change integrated assessment modeling and related research. One goal of the workshop will be to catalyze peer-reviewed literature and improvements in modeling capabilities that can directly inform near-term analyses, including the next round of interagency SCC discussions. A second goal will be to identify and prioritize longer-term research that will advance the USG's ability to incorporate information about climate change impacts into policy and regulatory analyses.

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The workshops will include:

- 1) a review of existing IAMs and discussion of conceptual issues involved in improving the estimation of climate damages for policy analysis, and
- 2) a constructive audit of existing empirical research on climate change impacts and damages aimed at refining the current representation of these effects in IAMs and motivating new research to fill critical gaps.

Part I will begin with an introduction to the workshop, including a recap of the previous inter-agency SCC process, and an overview of existing IAMs. This will be followed by a detailed exploration of several critical modeling issues that emerged during the inter-agency process. These include challenges such as: extrapolating impacts to high temperatures, assessing risks of catastrophic climate changes, projecting adaptive capacity, accounting for impacts of climate change on economic growth, incorporating more sectoral interactions,

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coupling economic models with more detailed earth system models and more. Next there will be a presentation of a generalized, transparent, and flexible climate change damage assessment framework that can be easily updated as new research is completed and rapidly deployed as new policies are proposed. Part I will conclude with a broader discussion of approaches for incorporating climate damage assessments into policy analysis. This part of the workshop will help identify recommendations for future model developments needed to improve estimation of the economic benefits of GHG reducing policies in both the short and long term. In the short term (i.e., within the next 2 yrs), these discussions will help identify the aspects of existing models that could be incorporated within a more general modeling framework in order to improve the climate damage assessments for the next round of interagency SCC discussions (including the development of marginal benefit estimates for non-CO2 GHG emission reductions). The recommendations of the workshop participants also will help identify and prioritize longer term research needs that, in part, focus on how to incorporate additional realism/complexity into climate policy analysis.

Part II, the second workshop, will aim to document and synthesize the latest research on climate change impacts and the associated economic damages in order to identify key knowledge gaps and motivate additional peer-reviewed research that can directly contribute to improving integrated assessment modeling. In the short term, this will help to identify existing research which could be utilized in the calibration of damage functions for the next USG SCC analysis (expected to begin in early 2012). These discussions will aid EPA in prioritizing near term research needs on particular impact and damage categories. In addition to catalyzing additional peer-reviewed work that can be incorporated into future IAMs, the workshop will explore the development of an open-architecture database that will help to organize and synthesize the findings from climate change impact and damage studies as they accumulate over time.

Part I and II workshops could be separated in time by a few months but should be planned somewhat concurrently. The first workshop should be held in Fall-Winter of 2010, ideally with Part I taking place in November, and Part II in early December or January 2011. Participants should come from federal agencies, academia, and NGOs. A smaller, invitation only audience may provide more technical, focused discussion. Some participants may be invited to only one part of the workshop.

The contractor shall:

1. secure a location for the first and second workshops, invite participants, and handle all technical logistics of conducting the workshop,
2. make all slide presentations and Q&A available on line as a proceedings document,
3. summarize the workshop and recommendations from Parts I and II in a report to EPA,
4. help to organize the publication of select papers from Parts I and II (e.g., in a special issue of *Climatic Change* or other interdisciplinary journal), and
5. make recommendations on a framework for an open-architecture impacts database that can be easily accessed and managed by relevant academic researchers and government analysts to track the latest research on climate impacts and associated economic damages going forward.

The qualified contractor shall have extensive expertise in working on climate change issues, including in-house technical experts focused on climate change impacts and adaptation strategies; have extensive experience in organizing and hosting technical workshops for government and academic audiences; and be skilled at integrating and managing multidisciplinary teams.

### **III. QUALITY ASSURANCE (QA) REQUIREMENTS**

The Contractor shall submit with their technical proposal a written Quality Assurance Project Plan for any project that is developing environmental measurements or a Quality Assurance Supplement to the Quality Management Plan for any project which generates environmental data using models.

#### **IV. TASKS AND DELIVERABLES:**

The WAM will review all deliverables in draft form and provide revisions and/or comments to the contractor. The contractor shall prepare the final deliverables incorporating the WAM's comments. Contractor shall provide the WAM with both electronic and hard copy versions of all deliverables.

Contractor personnel shall at all times identify themselves as Contractor employees and shall not present themselves as EPA employees. Furthermore, they shall not represent the views of the U.S. Government, EPA, or its employees. In addition, the Contractor shall not engage in inherently governmental activities, including but not limited to actual determination of EPA policy and preparation of documents on EPA letterhead.

**Task 1: Prepare Workplan** (Contract Reference EP-W-08-018: Technical support, Communications, Outreach, Design, Graphics, and Meeting Facilitation Page 9-12)

The contractor shall prepare a work plan, in accordance with the terms of the contract, upon receipt of a work assignment signed by the Contracting Officer. The work plan shall outline and describe the approach that will be taken for finding a venue/workshop location and arranging audiovisual needs and support, hotel lodging, inviting and contacting speakers and attendees, logistics for both attendees and invited speakers. The plan shall also include the timeline and due dates for deliverables, as well as a detailed cost estimate by task and a staffing plan. The plan will serve as the roadmap for implementation of the workshop.

The WAM and the CO will review the work plan. However, only the CO can approve/disapprove the work plan. The contractor shall prepare a revised work plan incorporating the Contracting Officer's comments, if required. Included in this task are the administrative functions needed for this work assignment.

Deliverables and Schedule for Task 1:

- 1a.** Submit the work plan to the WAM, in accordance with the terms of the contract, upon receipt of the Work Assignment.
- 1b.** Submit revised workplan, in accordance with the terms of the contract, if required.
- 1c.** Within one week following Work Plan approval of this Work Assignment, a kick-off meeting or teleconference shall be held between the Contractor and WAM to discuss the technical elements of the project.
- 1d.** Within 4 weeks of Work Plan approval, the contractor shall set up a password protected website to help keep track of workshop logistics. This website shall later be migrated to the EPA website and be accessible to workshop participants and attendees for workshop information, papers, and presentations.

**Task 2: Select date and secure workshop location** (Contract Reference: Communications, Outreach, Design, Graphics, and Meeting Facilitation Page 11)

EPA will provide the contractor with general criteria for location of the first and second workshops and the space. The contractor will make the necessary arrangement to acquire the space for the period of the first and the second workshops. The workshop date(s) shall accommodate the agenda (i.e., 1-2 days for Part I and 1-2

days for Part II, as needed) and the location shall be in an easily accessible location for travel purposes (e.g., DC metro area). The location shall accommodate approximately 100 attendees.

**Deliverables and Schedule for Task 2:**

**2a.** Submit a list of candidate locations and dates to WAM as soon as possible, but no later than 4 weeks following the completion of Task 1c.

**2b.** Submit confirmation that location is secured within 1 week of receiving comments about candidate locations from WAM.

**Task 3: Develop Workshop Agendas** (Contract Reference: Communications, Outreach, Design, Graphics, and Meeting Facilitation page 11 #23)

The contractor, in conjunction with the WAM, shall develop the agenda for the workshop that will allow for approximately 30 speakers and time for discussion, along the lines of the following:

Part I. Modeling Climate Change Impacts and Associated Economic Damages

Day 1

***Introduction to the Workshop*** [1-2 speakers, ~45 minutes]

Welcome, Purpose and Overview of Part I and II

Technical background and review of SCC process (will include discussion of limitations highlighted in SCC writeup (e.g., lack of values for non-CO2 GHGs))

Broader Policy Context and Questions: Brief overview of approaches for incorporating climate impacts assessment and estimates of associated economic damages into policy analysis.

***Session 1: Overview of Existing Integrated Assessment Models*** [6 speakers + Q&A, ~2.5-3 hours]

The Session moderator will start by providing a very brief overview of IAMs and the common components in them. He/she will also describe the charge questions that each modeler was asked to address in his presentation. This will help develop a common format so the audience can transition between the three models more easily. (The charge questions should be partly based on the themes that follow in Section 3, so that the modelers elaborate on how their models deal with those items.)

- a. Models used for development of current USG SCC values
  - i. DICE (Nordhaus)
  - ii. PAGE (Hope)
  - iii. FUND (Tol/Anthoff)
- b. More complex characterization of climate impacts based on other Integrated Assessment Models
  - i. Overview of other Integrated Assessment Models
  - ii. GCAM (JGCRI – UMD/PNNL) and development of iESM (PNNL/LBNL/ORNL)
  - iii. IGSM (MIT)

***Lunch*** [1 hour]

***Session 2: Near Term DOE and EPA Efforts*** [2 speakers, 1 discussant, Q&A ~1.5 hours]

- a. Proposed Impacts Knowledge Platform (DOE)
  - Overview of a proposed open-architecture impacts database that can be easily accessed and managed by relevant academic researchers and government analysts, help identify knowledge gaps and provide a framework for future damages research, and be incorporated into integrated assessment research, and
- b. Proposed Generalized Modeling Framework (EPA)
  - Overview of a proposed generalized modeling framework for valuing climate change impacts. The framework would combine the key elements of existing IAMs into a unified model, and would promote a standardized set of accounting conventions for the representation of various pathways through which climate changes may affect economic productivity and human well-being. The model would be transparent, fully documented, and freely available to the public.

***Session 3: Critical Modeling Issues in Assessment and Valuation of Climate Change Impacts*** [5-10 speakers + discussion, ~5.5 hours, with part spilling onto day 2]

- a. Sectoral and regional disaggregation and interactions
- b. Incorporation of natural and socio-economic uncertainty
- c. Extrapolation of damage estimates to high temperatures, including Earth system tipping points and potential associated economic catastrophes
- d. Nonmarket Impacts (incl. discussion of multiplicative vs. additive damages, and multivariate utility functions)
- e. Adaptation and technological change
- f. Methods for extrapolating exogenous variables to model time horizon

**Day 2**

***Welcome*** [10-15 minutes]

Recap of Day 1, Overview of Day 2

***Session 3 (continued)*** [Number of speakers and time TBD after finalizing Day 1 schedule]

***Session 4: Approaches for Incorporating Climate Impact Assessments into Policy Analysis*** [3 speakers + discussion, ~1.5-2 hours]

- a. Benefit-cost analysis (based on “potential compensation test”)
  - i. Using the SCC for marginal policies
  - ii. Direct calculation of NPV for non-marginal policies
  - iii. Accounting for risk aversion
- b. Social welfare analysis (based on explicit “social welfare function”)
  - i. equity weights
  - ii. discounting based in part on intergenerational equity considerations
- c. Other approaches:
  - i. Cost-effectiveness analysis
  - ii. Risk management decision frameworks

*[Note: The organization of Session 4 is still provisional, but we want to make sure the distinction between BCA based on potential compensation and social welfare analysis is prominent.]*

Part II. Research on Climate Change Impacts and Associated Economic Damages [~2 days]

**Introduction** [1-2 speakers, 15-30 minutes]

Recap of Part I, Purpose and outline of Part II  
Recap of proposed Impacts Database/Knowledge Platform

**Sessions covering research on various impact categories** [~9-18 speakers + discussion]

- A. Agriculture
- B. Human Health
- C. Water Availability
- D. Ecosystems and Ecosystem Services (including biodiversity loss)
- E. Coastal Zone
- F. Ocean Acidification
  - i. Overview of chemistry and how it should inform SCC
  - ii. Modeling impacts to coral reefs and associated damages (ORD ESRP)
  - iii. Modeling impacts to fisheries and associated damages (NOAA)
- G. Energy Production and Consumption
- H. Socio-economic and geopolitical impacts, including migration and national security
- I. Others

*[Notes: The provisional list above is roughly the categorization used in NRC (2010).<sup>1</sup> This structure could accommodate two presenters per category if desired – one with expertise in the relevant physical science impacts and the other with expertise in the economics research linking climate impacts to economic damages.]*

*Catastrophic impacts are covered in Part I instead of Part II because it is difficult to discuss how they should be represented in a bottom-up model without discussing what the catastrophic events are. However, another catastrophic presentation may be appropriate in Part II to discuss the latest science on catastrophic impacts and the probability of their occurrence, or we can ask each presenter to address how “catastrophic” events might impact their particular sector.]*

**Deliverables and Schedule for Task 3:**

- 3a.** Submit a draft agenda for the workshop (Part I ) within 2 weeks of completion of Task 1c and within 4 weeks for Part II.
- 3b.** Submit a revised agenda within 2 weeks of receiving comments from the WAM on 3a.
- 3c.** Submit final agendas within 1 week of securing commitments from all speakers.

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<sup>1</sup> National Research Council. 2010. Hidden Costs of Energy: Unpriced Consequences of Energy Production and Use. Washington, D.C.: National Academies Press.  
[http://www.nap.edu/catalog.php?record\\_id=12794](http://www.nap.edu/catalog.php?record_id=12794) .



**Task 4: Identify speakers, moderators, and attendees and invite all participants** (Contract Reference: Page 11, #23 logistical support)

The contractor shall identify speakers and attendees, with a goal of approximately 30 total participants at the workshop (including presenters, discussants and moderators) and 100 total attendees. The speakers shall include researchers with extensive expertise in the topics covered in their session. Qualified speakers should have backgrounds in economics and/or natural sciences relevant to integrated assessment modeling and climate impacts assessment and be recognized experts in their field. The contractor shall provide each participant with the goals of the workshop and/or charge questions developed in a later task. The contractor shall clearly explain verbally and in writing the roles for each participant. Speakers shall be compensated for their travel expenses and receive an honorarium for their services.

The contractor shall identify a moderator for each session with expertise in the research topics covered in their session. The moderator shall not only ensure that the schedule is adhered to, but also shall be able to stimulate the discussion if needed. The moderators shall not receive compensation for their participation, and may come primarily from EPA, DOE, or other Federal agencies.

Attendance at the workshop will be by invitation only. Attendees should come from federal agencies, academia, and NGOs and have technical expertise in economics and/or natural sciences related to climate impacts.

**Deliverables and Schedule for Task 4:**

- 4a. Submit candidate list of speakers and moderators within 2 weeks of completion of Task 1c.
- 4b. Submit final list of speakers and moderators within 4 weeks of receiving comments from WAM on 4a.
- 4c. Extend invitations to speakers within 1 week of completing 4b.
- 4d. Submit candidate list of attendees within 2 weeks of completing 4b.
- 4e. Submit final list of invited attendees within 2 weeks of receiving comments from WAM on 4d.
- 4f. Submit final list of committed speakers at least 3 months before Part I of the workshop.
- 4g. Send invitations to attendees 2-3 months before Part I of the workshop.

**Task 5: Conduct Workshops (Part I and Part II)** (Contract Reference: Page 11, #23)

The contractor shall host and provide logistical support during the workshops on the scheduled date(s). Researchers shall make their presentations, discussants (if applicable) will present their comments, and time shall be allocated for questions and discussion. The contractor shall identify a moderator for each session and the moderator shall be familiar with the research topic for their session. The moderator shall not only ensure that the schedule is adhered to, but also shall be able to stimulate the discussion if needed. The contractor shall arrange for all necessary audio-visual equipment (e.g., LCD projector, laptop computer, flip charts) and other necessary materials (e.g., handouts). The contractor shall handle all logistics associated with the facility (e.g., security, room temperature, appropriate noise levels). The contractor shall also arrange for necessary transcription of workshop discussions in order to write the summary report.

**Deliverables and Schedule for Task 5:**

- 5a. Confirm logistical details with WAM 2 weeks prior to the workshop start date.
- 5b. Host workshops on scheduled date(s).

**Task 6: Write Summary Report (Contract Reference: Page 12 #23)**

The contractor shall prepare a summary report of the workshops. The report shall include summaries of the presentations on the agenda and discussions throughout the workshop, including any question and answer sessions. The report shall try to synthesize any recommendations made by the workshop participants highlighting future research needs and next steps.

**Deliverables and Schedule for Task 6:**

- 6a.** Facilitate a meeting among the workshop organizers within 1 week following Part I of the workshop to gather feedback on general impressions, lessons, and key recommendations gleaned from the workshop presentations and discussions. The discussion from this meeting shall aid the contractor in drafting the summary report.
- 6b.** Post links to all slide presentations and papers from Part I on the website within 2 weeks of the end of Part I of the workshop. Make the website accessible to all participants of both Part I and Part II.
- 6c.** Facilitate a meeting among the workshop organizers within 1 week following Part II of the workshop to gather feedback on general impressions, lessons, and key recommendations gleaned from the workshop presentations and discussions. The discussion from this meeting shall aid the contractor in drafting the summary report.
- 6d.** Post links to all slide presentations and papers from Part II on the website within 2 weeks of the end of Part II of the workshop. Make the website accessible to all participants of both Part I and Part II.
- 6e.** Submit draft summary report within 4 weeks of completing 6c.
- 6f.** Submit final summary report within 3 weeks of receiving comments from the WAM on 6e.

**Task 7: (Contract Reference: Page 11 #23)**

The contractor shall help to organize the publication of select papers from Parts I and II (e.g., in a special issue of *Climatic Change* or other interdisciplinary journal).

**Deliverables and Schedule for Task 7:**

- 7a.** Submit list of candidate outlets/journals, including information on the pros and cons of each, within 3 weeks of completing 4b.
- 7b.** Secure a commitment from the selected journal after receiving comments on 7a from the WAM.
- 7c.** Gather final papers from workshop participants, format them according to the journal guidelines, and submit them to the journal for review.

**Task 8: (Contract Reference: Technical support activities Pages 9-12)**

The contractor shall make recommendations on a framework for an open-architecture impacts database that can be easily accessed and managed by relevant academic researchers and government analysts to track the latest research on climate impacts and associated economic damages going forward.

**Deliverables and Schedule for Task 8:**

- 8a.** Submit draft memo outlining options for the creation of an open-architecture impacts database within 16 weeks of completion of Task 1c.

8b. Submit final memo explaining steps involved in creating the database within 3 weeks of receiving comments on 8a from the WAM.

#### X. SCHEDULE FOR DELIVERABLES:

The contractor shall provide the following specific deliverables to the EPA WAM:

	DELIVERABLE	FORM AND QUANTITY	SCHEDULE
Task 1:	1a. Work Plan	Electronic	In accordance with the terms of the contract
	1b. Revised Work Plan, if required.	Electronic	In accordance with the terms of the contract (if required)
	1c. Kick-off Meeting	Conference call/meeting	Within one week of Work Plan approval
	1d. Set up website.	Electronic	Within 4 weeks of Work Plan approval
Task 2:	2a. List of Candidate Locations and Dates	Electronic	Within 4 weeks following the completion of 1c.
	2b. Confirmation of Location and Dates	Electronic	Within 1 week of receiving comments from WAM on 2a.
Task 3:	3a. Draft Agenda	Electronic	Within 2 weeks of completion of 1c
	3b. Revised Agenda	Electronic	Within 2 weeks of receiving comments from the WAM on 3a
	3c. Final Agenda	Electronic	Within 1 week of securing commitments from all speakers
Task 4	4a. Candidate list of speakers and moderators	Electronic	Within 2 weeks of completion of 1c.
	4b. Final list of speakers and moderators	Electronic	Within 4 weeks of receiving comments from WAM on 4a
	4c. Invite speakers	Telephone and Formal Letter sent via email	Within 1 week of receiving comments from WAM on 4b
	4d. Candidate list of attendees	Electronic	Within 2 weeks of completing 4b
	4e. Final list of attendees	Electronic	Within 2 weeks of receiving comments from WAM on 4d.
	4f. Final list of committed speakers	Electronic	At least 3 months before Part I of the workshop.
	4g. Invite Attendees	Formal letter sent via email	2-3 months before Part I of the workshop

**Revised Statement of Work**

Contract: EP-W-08-018, Work Assignment: 2-5, Amendment: 0002

Task 5:	5a. Confirmation of logistical details	Electronic and Conference Call	2 weeks prior to the workshop start date
	5b. Host Workshop	In person	On scheduled date(s)
Task 6:	6a. Facilitate post-workshop meeting 1.	In person or via conference call	Within 1 week following Part I
	6b. Post Part I workshop presentation materials on website	Electronic	Within 2 weeks of the end of Part I of the workshop.
	6c. Facilitate post-workshop meeting 2.	In person or via conference call	Within 1 week following Part II
	6d. Post Part II workshop presentation materials on website	Electronic	Within 2 weeks of the end of Part II of the workshop.
	6e. Draft Summary Report	Electronic	Within 4 weeks of completing 6c
	6f. Final Summary Report	Electronic	Within 3 weeks of receiving comments from the WAM on 6e.
Task 7:	7a. Candidate List of Journals/Publication Outlets	Electronic	Within 3 weeks of competing 4b.
	7b. Commitment from selected journal	Electronic	As soon as possible after receiving comments from the WAM on 7a.
	7c. Submit final papers to selected journal	Electronic	As soon as possible after completion of the workshop and according to timeline agreed to with journal
Task 8:	8a. Draft memo on database options	Electronic	Within 16 weeks of completion of Task 1c
	8b. Final memo on database process	Electronic	Within 3 weeks of receiving comments from the WAM on 8a.

United States Environmental Protection Agency  
Washington, DC 20460

## Work Assignment

Work Assignment Number

2-5

☐ Original ☒ Amendment Number: 3Contract Number  
EP-W-08-018Contract Period  
Base

Option Period Number: 1

Title of Work Assignment  
Workshop on Improving Assessment and  
Valuation of Climate Change Impacts for  
Policy and Regulatory AnalysisContractor  
ICF SERVICES COMPANY, L.L.C.

Specify Section and Paragraph of Contract SOW

Purpose: ☐ Work Assignment Initiation ☐ Work Assignment Close-Out  
☒ Work Assignment Amendment ☐ Incremental Funding  
☒ Work Plan Approval

Periods of Performance

From: 05/19/10

To: 03/10/11

Comments:

The purpose of this amendment is to approve the Contractor's work plan and cost estimate  
dated September 3, 2010.☐ Superfund

## Accounting and Appropriations Data

☒ Non-Superfund

Line	DC (Max 6)	Budget/FYs (Max 4)	Appropriation Code (Max 8)	Budget Org/Code (Max 7)	Program Element (Max 9)	Object Class	Amount	(Dollars)	(Cents)	Site/Project (Max 8)	Cost Org/Code (Max 7)
1											
2											
3											
4											
5											

## Authorized Work Assignment Ceiling

Contract Period:	Cost/Fee	LOE
Previously Approved	\$0.00	1,600
This Action	\$362,054.00	(71)
Total	\$362,054.00	1,529

## Work Plan / Cost Estimate Approvals

Contractor WP Dated: 09/03/10	Cost/Fee: \$362,054.00	LOE: 1,529
Cumulative Approved:	Cost/Fee: \$362,054.00	LOE: 1,529

Work Assignment Manager Name

ANDREW P. MANALE

(Signature)

(Date)

Branch/Mail Code

Phone Number

Fax Number

Project Officer Name

RYAN T. DANIELS

(Signature)

(Date)

Branch/Mail Code

Phone Number

Fax Number

Other Agency Official Name

DEBRA A. MILLER

(Signature)

(Date)

Branch/Mail Code 3803R

Phone Number 202-564-1041

Fax Number

Contracting Official Name

DEBRA A. MILLER

(Signature)

(Date)

Branch/Mail Code 3803R

Phone Number 202-564-1041

Fax Number

Contractor Acknowledgement of Receipt and Approval of Workplan (Signature and Title)

Date

# Workshop on Improving Assessment and Valuation of Climate Change Impacts for Policy and Regulatory Analysis

Contract: EP-W-08-018, Work Assignment: 2-5, Amendment: 0003

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## Summary Information

Title: Workshop on Improving Assessment and Valuation of Climate Change Impacts for Policy and Regulatory Analysis

Period of Performance: From: 05/19/10 To: 03/10/11

Award Date: 05/19/10

Total Funding:

## WA Totals

*The following item(s) have been added:*

Category	POP	Amount
Estimated Cost	Option 2	(b)(4)
Fixed Fee	Option 2	

## WA Classification

*The following changes have occurred:*

The Labor Hour Ceiling has changed from 1600 to 1529.